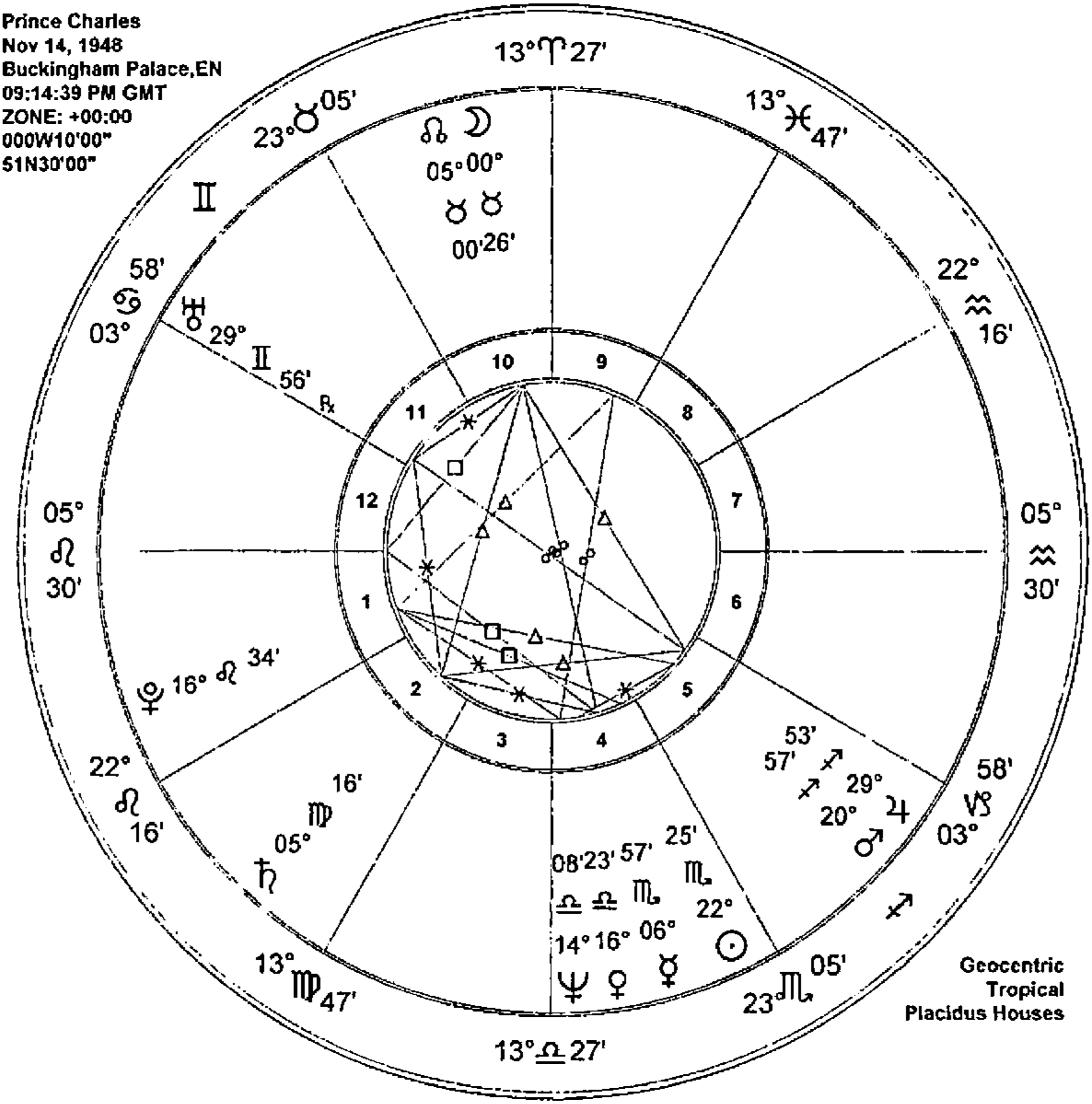
PRIMARY DIRECTIONS

A Primer of Calculation

by
Bob Makransky

www.dearbrutus.com

Prince Charles
Nov 14, 1948
Buckingham Palace,EN
09:14:39 PM GMT
ZONE: +00:00
000W10'00"
51N30'00"



Geocentric
Tropical
Placidus Houses

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PREFACE

The present volume assumes on the part of the reader a grasp of plane trigonometry; transference of this knowledge to the sphere should present no difficulties. It is suggested that the reader who has no familiarity with the material presented read the text through once quickly to acquire an overview of the subject without troubling over understanding all the details. However, the material in Chapter I (the celestial sphere) must be mastered before proceeding.

The subject of primary directions, while by no means difficult to understand, is nonetheless rather intricate in its ramifications and (like most geometric exercises) resists simple description in words. Therefore the text has been made as concise as possible, and the reader is referred to the many figures and example problems for a more eloquent exposition.

Insofar as is possible, the nomenclature and notation employed herein adhere to the usage of previous authors on the subject. All examples are taken from the horoscope of Prince Charles.

The present volume is essentially a manual of calculation, hence no interpretations are given (except for the fixedstars, whose symbolism is not adequately described elsewhere in the literature). See also Chapter XII (Evaluation).

The following points should be noted:

1. It goes without saying that in any addition or subtraction of arcs (except in the case of an arc of direction, where a negative value indicates a converse direction), if the sum or difference exceeds 360, then 360 should be subtracted from it; and if it is negative, then 360 should be added to it, unless noted otherwise (as, for example, in the True Solar Arc in RA algorithm).
2. In all formulas the signed values of Ø (terrestrial latitude), B (celestial latitude), and D (declination) should be used, i.e., if either of the latitudes or the declination is south then Ø, B, or D will be negative. If the absolute value of a variable is required it will be enclosed between vertical bars (| |).
3. When Ø or pole have negative values, then the terms co Ø or copole will be taken to mean -Ø-90 or -pole-90, respectively, rather than 90-Ø or 90-pole.
4. The principal values of the inverse trigonometric functions are to be taken (Arcsin and Arctan between -90 and 90; Arccos between 0 and 180); i.e., in any formula where the Arctan function returns a negative value, this is the value that should be used in subsequent computations (rather than adding 180 or 360 to it) except where noted otherwise.
5. In iterative algorithms, if the successive iterations should oscillate rather than converge, take the value around which they are oscillating. This will be sufficiently close for astrological purposes.

Although every effort has been made to insure accuracy in the text and figures, the author would appreciate notification of any errors that may come to the reader's attention so that correction may be made in future editions.

The author is grateful to many persons who have contributed ideas and made helpful suggestions, and in some cases have shared prodigious stores of information. Thanks are particularly due to Alexander Marr, Dr. Margaret Millard, Michael Munkasey, Michael Sheketoff, Darrel Waldthausen (who did the drawings); and extra special thanks to Roger House, who helped brainstorm the original idea for this book, and without whose inspiration it would not exist.

PREFACE TO REVISED (1992) EDITION

In this revised edition several addenda have been added at the end. It is suggested that the reader peruse the first of these (Primary Directions - An Overview, page 131) before tackling the book proper.

Further research (since the original publication of this book) has shown that major zodiacal directions to angles equated to time with the True Solar Arc in RA (taking orbs of plus or minus one month) have greater validity than was credited to them in the original Evaluation.

CHAPTER I: REVIEW OF SPHERICAL TRIGONOMETRY AND THE CELESTIAL SPHERE

In astrology, the vault of the heavens is considered to be a sphere of infinite radius, whose center is the center of the earth. The planetary and stellar bodies are regarded as occupying points on the surface of the celestial sphere. To an observer on the earth the celestial sphere seems to rotate in the course of a day, causing the planets and stars to successively rise, culminate, and set. This apparent diurnal motion of the planets and stars is the basis for the primary system of prediction, and the predictions obtained from it are known as **primary** directions.

Since the relationships upon which primary directions are based are measured on the surface of a sphere, a brief review of spherical trigonometry (sufficient to understand everything which follows) will be given here.

SPHERICAL TRIANGLES

A great circle on a sphere is the intersection of the sphere with a plane passing through the center of the sphere. The poles of a great circle are the two points at which the sphere is cut by the line through the center of the sphere perpendicular to the plane of the great circle. Any great circle passing through the poles of a given great circle intersects the given great circle at right angles.

A great circle is completely specified by two parameters: the point at which it intersects the equator (its "W"), and the angle at which it intersects the equator (its "copole").

A small circle is the intersection of the sphere with a plane not passing through the center of the sphere.

A spherical triangle is the surface of a sphere bounded by three arcs of great circles meeting in three points. Note that the arcs must be of great circles. The sides of spherical triangles as well as the angles are measured in degrees, since they are arcs of great circles; the measure of an arc is the angle between the endpoints of the arc as observed from the center of the sphere.

If at least one angle of a spherical triangle measures 90, then the triangle is a right spherical triangle.

NAPIER'S RULES

In any right spherical triangle ABC (Figure I-1) with hypotenuse c opposite right angle C and sides a and b opposite angles A and B, respectively, the following relations obtain (Napier's Rules):

Rule 1: sin a = sin A sin c
Rule 2: sin b = sin B sin c
Rule 3: cos c = cos a cos b
Rule 4: cos A = cos a sin B
Rule 5: cos B = cos b sin A
Rule 6: cos c = cot A cot B
Rule 7: cos B = tan a cot c
Rule 8: cos A = tan b cot c
Rule 9: sin a = tan b cot B
Rule 10: sin b = tan a cot A

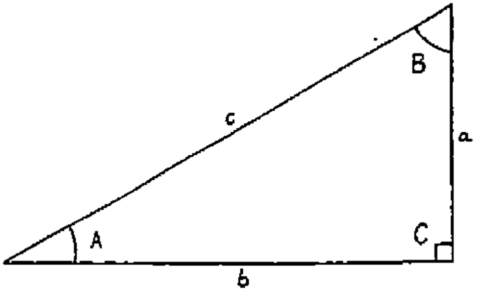

Figure I-1

Napier's Rules are used to solve for the unknown sides and angles of right spherical triangles once any two of them (other than the right angle) are known. Rules for solving oblique spherical triangles (SAS, ASA, etc.) exist but will not be used here.

THE CELESTIAL SPHERE

The celestial sphere will be depicted here (Figure I-2) as if from a vantage point outside of it and slightly above it. The center of the sphere is the center of the earth, upon which the observer is standing. The **horizon** (observer's horizon extended out infinitely) is the great circle where the celestial sphere is cut by a plane through the center of the earth parallel to the plane tangent to the earth at the observer's location (actually these two planes are the same since the celestial sphere is considered to have infinite radius, which diminishes the radius of the earth to zero). The observer's zenith is the point directly above his head, where the celestial

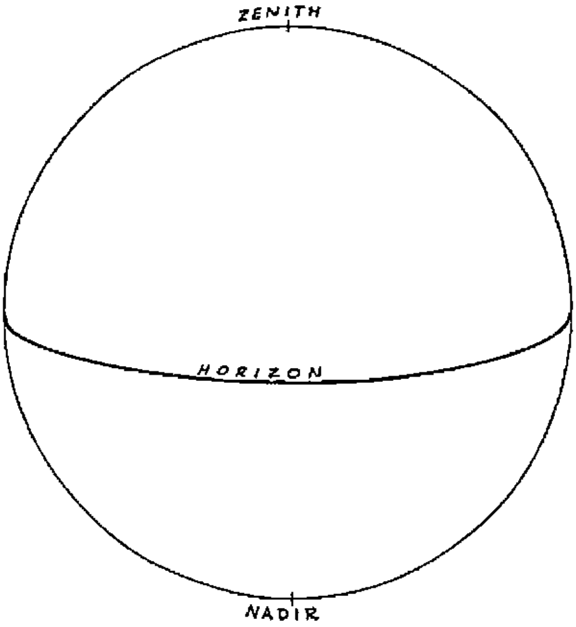

Figure I-2

sphere is cut by the line through the observer perpendicular to his horizon. The nadir is the opposite point, directly beneath the observer's feet. Thus the zenith and nadir are the poles of the horizon.

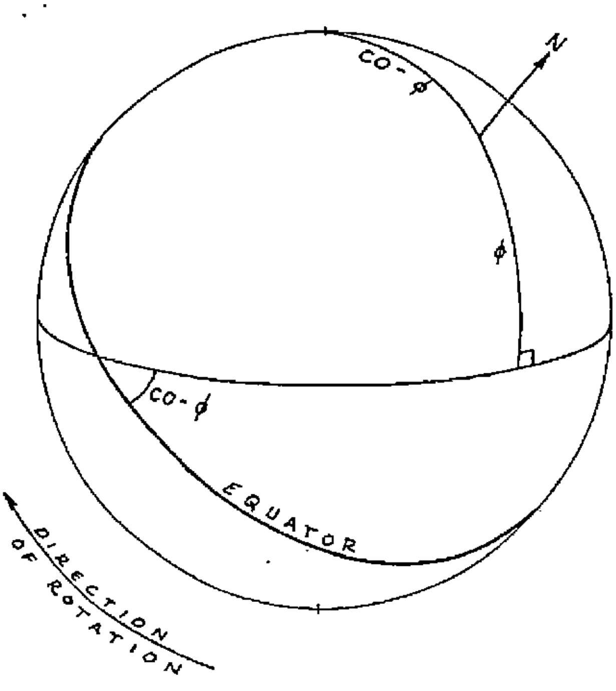

Figure I-3

The **north celestial pole** (Figure I-3) is the northern* point on the celestial sphere where it is cut by the earth's axis of rotation, and the **south celestial pole** is the opposite point. At the present time the north celestial pole is approximately marked by the star Polaris. The **celestial equator** (or simply **equator**) is the intersection of the celestial sphere with the plane of the earth's equator, i.e. it is the great circle whose poles are the north and south celestial poles. Observe that the angle between the horizon and the celestial equator equals the observer's colatitude (co Ø = 90 minus observer's terrestrial latitude). Observe too that the measure of the perpendicular arc from the observer's horizon to the north celestial pole equals observer's terrestrial latitude (Ø). Figure I-3 is drawn for an observer located at about 50 degrees north terrestrial latitude; for an observer in the southern hemisphere the foregoing measurements should of course be made to the south celestial pole.

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*North pole on the celestial sphere is determined with the left-hand rule: curling the fingers of the left hand in the direction of rotation, the thumb will point to the north pole. Evidentally, since the earth rotates in the opposite direction from the celestial sphere, its north pole is determined from the right-hand rule.

GEOGRAPHIC AND GEOCENTRIC LATITUDE

There are two possible values of Ø (terrestrial latitude of observer or birthplace) which can be used to compute primary directions (Figure I-4).

Geographic latitude, which is the type found on maps and in gazetteers, is the angle between the plane of the equator and the line perpendicular to the horizon at the location of the observer.

Geocentric latitude is the angle between the plane of the equator and the line which passes through the center of the earth and the location of the observer.

Because the earth is an oblate spheroid rather than a true sphere, these two types of latitude may differ (by up to 12' of arc). Geocentric latitude can be computed from geographic latitude as follows:

Geocentric Ø = Arctan (.9933 tan Geographic Ø)

For example, at 51 N 30 geographic latitude the geocentric latitude is 51 N 18.

When Ø appears in a formula in this book it usually represents the complement of the angle between the equator and the horizon, i.e., the complement of the geographic latitude. Therefore, while geocentric latitude has been used by some practitioners of primary directions, geographic latitude better describes the astronomical situation, and geographic latitude will be used exclusively in all the examples in this book.

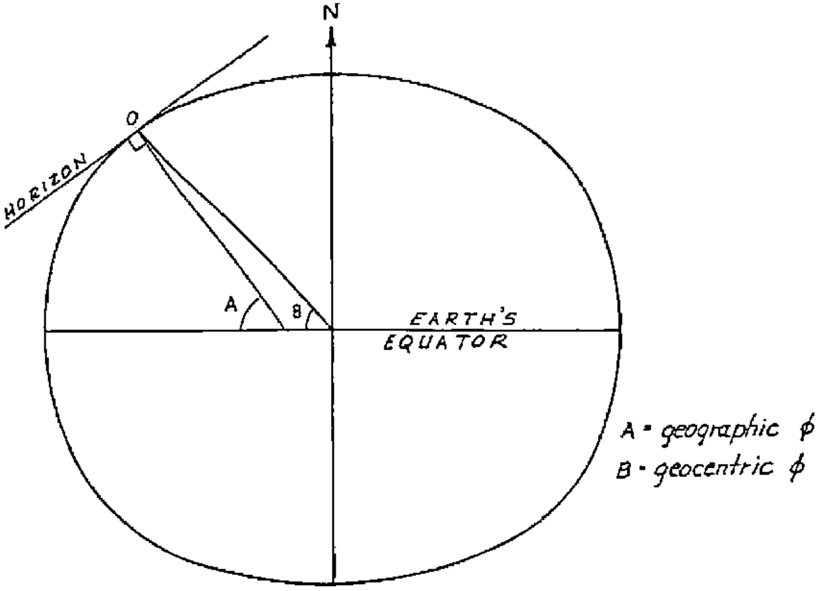

Figure I-4

LOCAL SPACE

An **hour circle** is a great circle passing through the north and south celestial poles. The **meridian** is that hour circle which passes through the zenith and nadir (Figure I-5). Since it passes through the poles of both the equator and horizon, the meridian must necessarily be perpendicular to both of these great circles.

The **North point** on the horizon is the intersection of the horizon and the meridian on the north side of the equator, and the **South point** on the horizon is the point opposite.

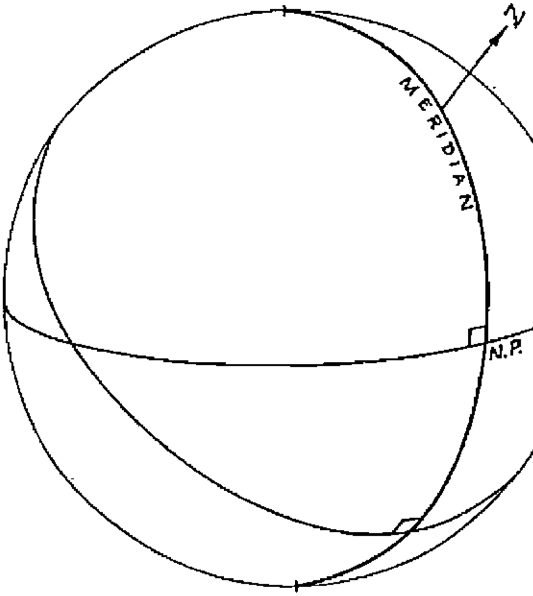

Figure I-5

A **vertical circle** is a great circle passing through the zenith and nadir; hence all vertical circles intersect the horizon at right angles. Evidentally, the meridian is a vertical circle as well as an hour circle. The **prime vertical** (Figure I-6) is that vertical circle whose poles are the North and South points on the horizon. Observe that the prime vertical intersects the horizon at the same points that the equator intersects the horizon. These points are the **East point** on the horizon (where the equator is rising) and the **West point** on the horizon (where the equator is setting). Thus the East and West points are the poles of the meridian. Observe that the angle between the prime vertical and the equator equals observer's geographic latitude (0).

The coordinate system defined by the horizon, meridian, and prime vertical is referred to as **local** (or **mundane**) **space**, because it remains invariant with respect to the observer. It is the matrix of the houses, where universal space is the matrix of the signs.

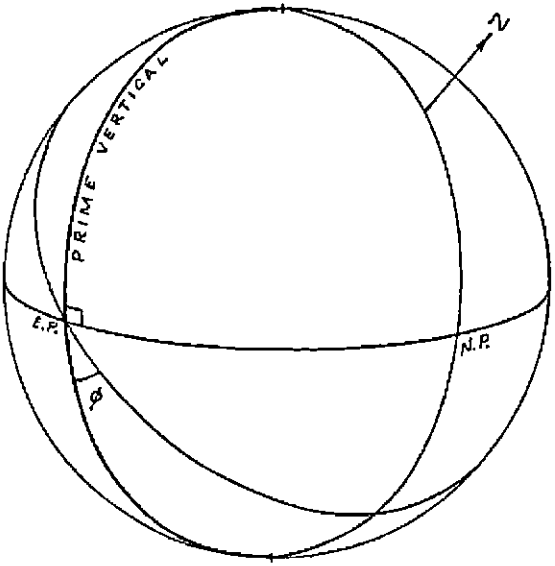

Figure I-6

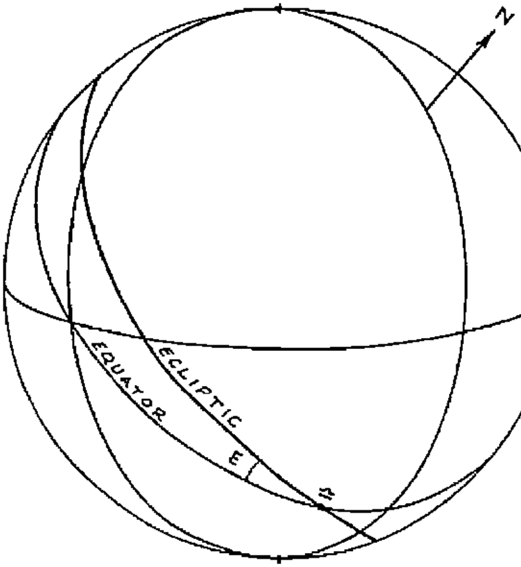

Figure I-7

The ecliptic (Figure I-7) is the great circle which is the sun's apparent annual path around the celestial sphere. The points where the ecliptic intersects the equator are the Aries point (where the sun crosses the equator from south to north, around March 21st) and the Libra point (where the sun crosses from north to south, around September 24th). In Figure I-7 the Libra point is shown just east of the meridian. A longitude circle is a great circle which passes through the poles of the ecliptic, i.e. which intersects the ecliptic at right angles. The angle between the celestial equator and the ecliptic is known as the **obliquity of the ecliptic** (E). Its value is given by:

$$E = 23.4523 - .013\ T$$

where T is in fractions of a century from 1 January 1900 (positive if after this date and negative if before it).
Example: Obliquity for 14 November 1948 = 1948.87. T = .4887, therefore E = 23.4459.

There are two coordinate systems used to locate points on the celestial sphere in universal space: the equatorial and the zodiacal coordinate systems.

RIGHT ASCENSION AND DECLINATION

In the equatorial coordinate system (Figure I-8) the position of a point P is specified in right ascension (RA) and declination (D). The right ascension of a point is the arc measured along the equator from the Aries point (moving south of the ecliptic) to the intersection with the hour circle passing through the point. The arc measured along this hour circle from the equator to the point is the declination of the point.

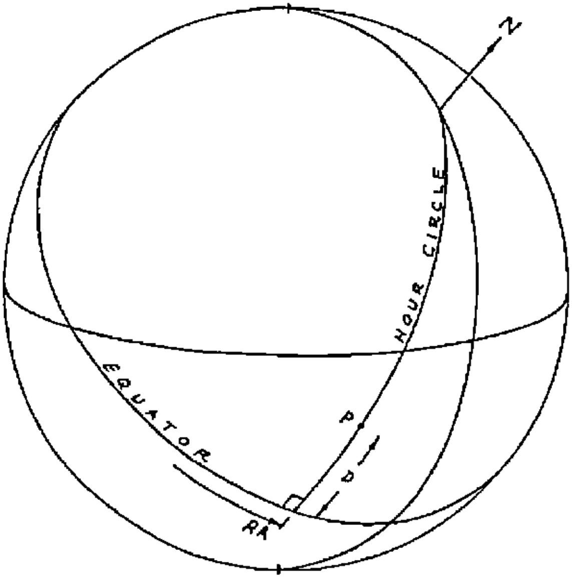

Figure I-8

CELESTIAL LONGITUDE AND LATITUDE

In the zodiacal coordinate system (Figure I-9) the position of a point P is specified in celestial longitude (or simply longitude, L) and celestial latitude (B).

The longitude of a point is the arc measured along the ecliptic from the Aries point (moving north of the equator) to the intersection with the longitude circle passing through the point. The arc measured along this longitude circle from the ecliptic to the point is the celestial latitude of the point.

Declination and celestial latitude are considered to be positive if the point lies north of the equator or ecliptic, respectively, and negative if the point lies south of the equator or ecliptic. They should be so taken in all the formulas which follow (except where noted otherwise). Most ephemerides list the declinations and celestial longitudes and latitudes of the planets, but not the right ascensions. RA must be computed from L and D with Appendix Formula A6, or from cos RA = cos L cos B / cos D.

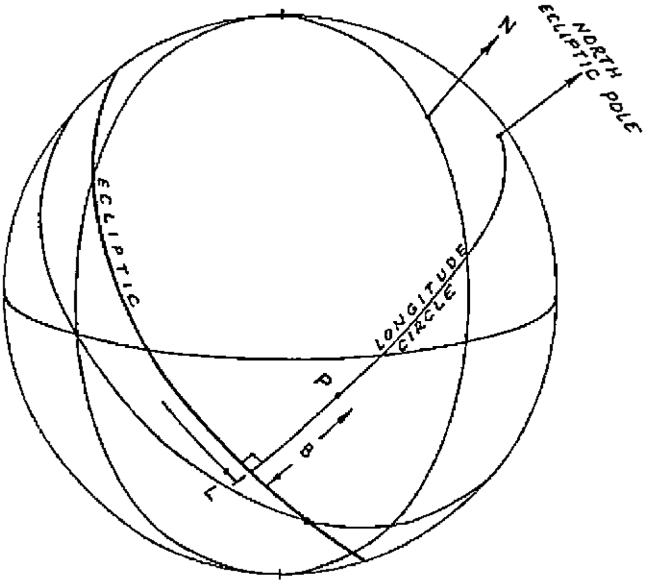

Figure I-9

THE ANGLES

The point where the ecliptic intersects the horizon on the eastern side of the meridian (Figure I-10) is known as the **Ascendant (ASC)**; the opposite point is the **Descendant (DESC)**. The point where the ecliptic intersects the meridian north of the prime vertical is known as the **Lower Meridian (IC)**, and the opposite point is the **Midheaven (MC)**.* The point where the ecliptic intersects the prime vertical on the western side of the meridian is known as the **Vertex (VTX)**, and the opposite point is the **Antivertex (AVTX)**. Sometimes the terms Ascendant, Descendant, Midheaven, Lower Meridian, Vertex and Antivertex are used to mean the longitudes of these points as well as the points themselves.

*For an observer in the southern hemisphere the IC is the intersection of the ecliptic with the southern meridian and the MC is the intersection of the ecliptic with the northern meridian. Similarly, the RAIC is the intersection of the equator with the southern meridian, and the RAMC is the intersection of the equator with the northern meridian.

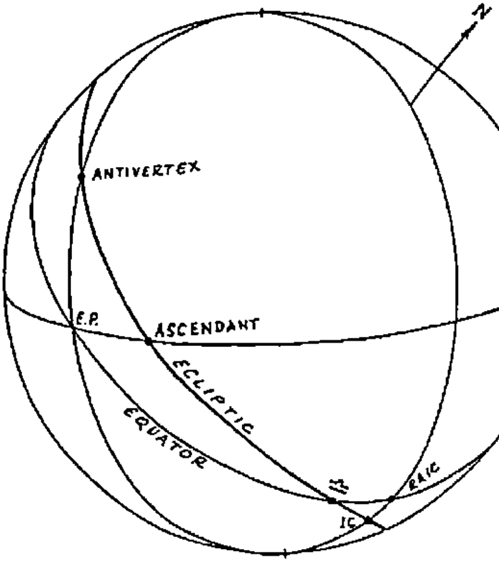

Figure I-10

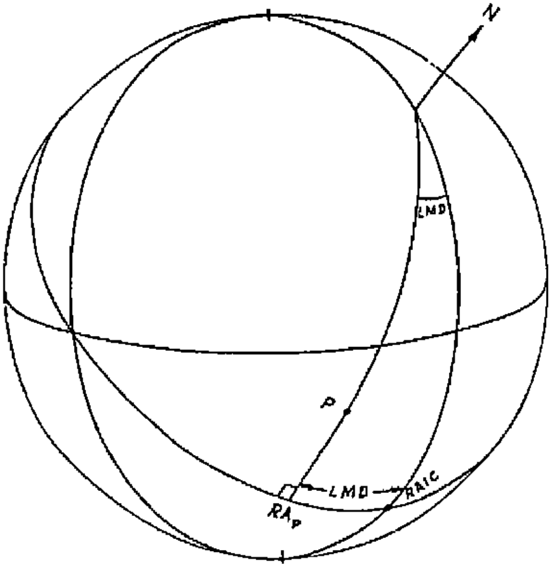

Figure I-11

The point of intersection of the equator with the meridian north of the prime vertical is known as the RAIC, and the opposite point is the RAMC. These terms are also used to mean the right ascensions of these points. Observe that the RA of the East point equals RAMC + 90 and the RA of the West Point equals RAMC - 90. The RAMC is measured in degrees; when it is measured in hours it is called Sidereal Time; i.e., the RAMC is numerically equal to 15 x Sidereal Time. The MC can be computed from the RAMC with Appendix Formula A3. The ASC can be computed from Ø and RAMC with Formula A8, and the VTX can be computed from the same formula substituting co Ø for Ø and RAIC for RAMC.

MERIDIAN DISTANCE

The upper meridian distance (UMD) of a point is the arc measured along the equator from the RAMC to the intersection with the hour circle through the point. It is numerically equal to |RAMC - RA|, where RA is the RA of the point. The lower meridian distance (LMD) of a point P (Figure I-11) is the arc measured along the equator from the RAIC to the intersection with the hour circle through the point. It is numerically equal to |RAIC - RA|. Evidentally, RAIC = RAMC + 180, hence LMD = 180 - UMD.

The meridian distance (MD) of a point is equal to either its UMD or its LMD, whichever is smaller. Observe that the MD of a point is also the angle between the hour circle through it and the nearest meridian (north or south).

SEMI-ARCS

The diurnal circle of a point P (Figure I-12) is the small circle parallel to the equator which passes through the point. The diurnal circle of a point is everywhere distant from the equator by the absolute value of its declination.

A time lapse photograph of the night sky, with the camera focused upon the north celestial pole, shows the diurnal circles of the stars as concentric circles with the north celestial pole at their center. Stars whose diurnal circles appear complete are known as circumpolar stars: they are always above the horizon at the observer's latitude (assuming the observer is in the northern hemisphere). The declinations of these

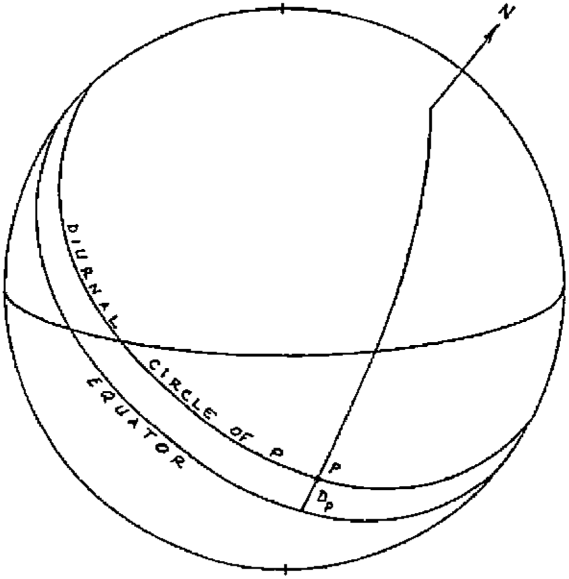

Figure I-12

stars exceed the observer's colatitude. Similarly, stars whose southern declinations exceed the observer's colatitude are circumpolar about the south celestial pole, and are always beneath the horizon at the observer's latitude.

Stars whose diurnal circles are tangent to the horizon have declinations equal to the observer's colatitude. Stars whose diurnal circles intercept the horizon have declinations less than the observer's colatitude.

Figure I-13 shows the celestial sphere projected onto the prime vertical, so that the meridian appears as a vertical line through the center. The portion of a point's diurnal circle which lies beneath the horizon at observer's latitude is termed the point's nocturnal arc; half this arc (the span of a lower quadrant) is the point's **nocturnal semi-arc (NSA)**. Similarly, half the portion of the point's diurnal circle which lies above the horizon (the span of an upper quadrant) is termed the point's **diurnal semi-arc (DSA)**. The terms NSA and DSA are also used to mean the measures of these arcs in degrees. The term **semi-arc (SA)** will be used to mean DSA for a point located above the horizon and NSA for a point beneath the horizon.

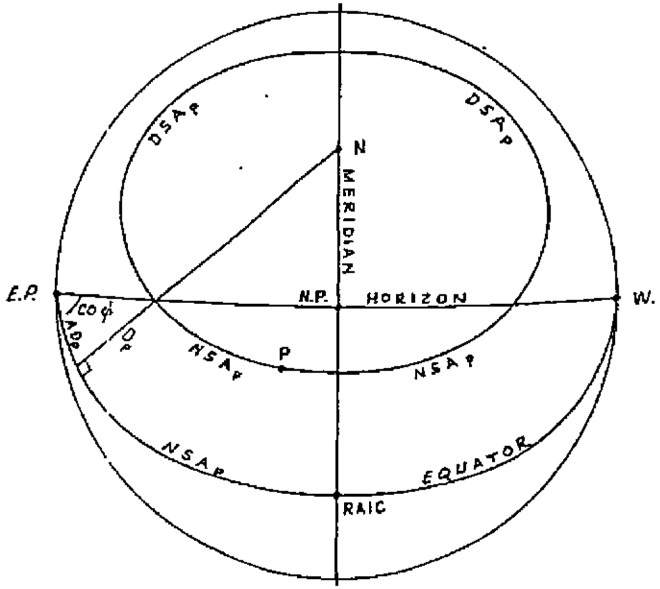

Figure I-13

ASCENSIONAL DIFFERENCE

The semi-arcs of a point can be computed as follows: consider the triangle whose sides are arcs of the horizon, the equator, and the hour circle through the intersection of the horizon and the diurnal circle of the point. The arc along the hour circle is numerically equal to D_P, the declination of the point. The opposite angle (between the horizon and equator) is equal to co Ø, the observer's colatitude. The arc along the equator from the East point to the intersection with the hour circle is termed the ascensional difference (AD) of the point. Then by Rule 10,

$$\sin AD_P = \tan D_P \cot \text{co } Ø \quad \text{or}$$

Formula I-1: $AD = \text{Arcsin} (\tan D \tan Ø)$

where D is the declination and Ø is the latitude. Since D and Ø are positive when north and negative when south, AD will be negative when D and Ø are of opposite signs. Since the arc along the equator from the East point to the RAIC equals 90, the value of the NSA will be equal to 90 - AD. Hence the nocturnal and diurnal semi-arcs of a point are given by:

Formula I-2: NSA = 90 - AD
DSA = 90 + AD

Example: For Ø = 51 N 30,
If D_{SU} = 18 S 23 then NSA_{SU} = 114.70
If D_{MO} = 11 N 14 then DSA_{MO} = 104.46

Observe that if UMD exceeds DSA or if NSA exceeds LMD then the point lies beneath the horizon, and if DSA exceeds UMD or if LMD exceeds NSA then the point lies above the horizon.

QUADRANTS

The meridian and horizon circles divide the celestial sphere into four lunes, termed quadrants. The 1st Quadrant (houses 1, 2, and 3 in most house systems) intercepts that arc of the prime vertical extending from the East point to the nadir. The 2nd Quadrant (houses 4, 5, and 6) intercepts that arc of the prime vertical extending from the nadir to the West point. The 3rd Quadrant (houses 7, 8, and 9) intercepts that arc of the prime vertical extending from the West point to the zenith. The 4th Quadrant (houses 10, 11, and 12) intercepts that arc of the prime vertical extending from the zenith to the East point.

It is not always possible to determine in which quadrant a body is located merely by inspection from the horoscope. For example, the ecliptic point with the same longitude as a body may cross the meridian after the body does (as is the case with the comet in Prince Charles' horoscope), and in that case the horoscope will show the body on the wrong side of the meridian. To determine unequivocally the quadrant in which a body is located, it is necessary to ascertain whether it lies on the eastern (RAMC < RA < RAIC) or western (RAIC < RA < RAMC) side of the meridian, and whether it lies above (UMD < DSA or LMD > NSA) or beneath (UMD > DSA or LMD < NSA) the horizon.

A body in the 1st Quadrant lies east of the meridian and beneath the horizon.

A body in the 2nd Quadrant lies west of the meridian and beneath the horizon.

A body in the 3rd Quadrant lies west of the meridian and above the horizon.

A body in the 4th Quadrant lies east of the meridian and above the horizon.

These are the standard quadrants, i.e. the quadrants as defined in the Campanus, Regiomontanus, and Placidus systems. However in other house systems (such as Porphyry and Alcabitius) the quadrants are defined in a quite different fashion, as will be noted in the chapter pertaining to these systems.

. The **Mundane Position** (MP) of a body may be thought of as its location with respect to the houses of the horoscope, i.e., its position in local space. The term "Mundane Position" is used in this book in three distinct but related senses:

In the first place, the Mundane Position of a body is taken to mean the set of points on the celestial sphere which are considered to be conjunct the body (according to the canons of the given house system). If this locus of points is a great circle on the celestial sphere, then it is termed a **projection circle** and the house system is termed a **projection house system**.

In the second place, it is sometimes convenient for the purpose of calculation to designate one of the points in this set (usually the one that lies on a given reference circle) as the canonical representative of the entire set.

In the third place, the Mundane Position of a body may mean a number measured on a scale of 0 to 360 which specifies the body's location with respect to local space. This numerical Mundane Position is defined for a given house system by two conditions:

Condition A: The numerical Mundane Position of the Nth house cusp (i.e. the MP of the ecliptic point with the longitude of the Nth house cusp) is given by:

$$MP = 360 \times (N - 1) / M$$

where M is the total number of houses. Usually M = 12, but some astrologers use 8 "watches" or 24 "half-houses", and in these cases M = 8 or 24, respectively. In the case of 12 houses, this function assigns to the first house cusp a Mundane Position of 0; to the second house cusp an MP of 30; to the third house cusp an MP of 60; and so on. This is an arbitrary condition based upon an arbitrary scale of 0 to 360 with an arbitrary starting point (the first house cusp) selected for convenience in computing the mundane Arabian parts; however some such boundary condition is necessary. In those cases where long established usage contradicts this choice of starting point, then this part of Condition A is forgone. For example, in the Horizontal house system numerical Mundane Position (azimuth) equals zero at the fourth house cusp rather than the first, and in the Regiomontanus system numerical Mundane Position (OA under own pole) equals zero at the Aries point, no matter what house it falls in.

Condition B: Two points which are conjunct according to the canons of the given house system must have the same numerical Mundane Position.

The foregoing definitions of Mundane Position are all based upon the notion of "conjunction," but "conjunction" has not yet been defined. In the next chapter the most primitive concept of conjunction - that of a body conjunct a great circle - will be presented, and Chapter IV will take up the more complex question of the conjunction of two bodies or points.

SPECULUM FOR PRINCE CHARLES

14 November 1948 GMT = 21 h 14 m 39 s ST = 0 h 49 m 28 s

Ø = 51 N 30 E = 23.4459

	LONG	LONG	LAT	DEC	RA	MD	AD
SUN	22 SC 25	232.42		18 S 23	230.01	37.64	-24.70
MOON	0 TA 26	30.44	0 S 25	11 N 14	28.47	16.10	14.46
MERCURY	6 SC 57	216.96	1 N 47	12 S 10	215.22	22.85	-15.73
VENUS	16 LI 23	196.38	1 N 50	4 S 46	195.79	3.42	- 6.02
MARS	20 SG 57	260.95	0 S 56	24 S 04	260.08	67.71	-34.16
JUPITER	29 SG 53	269.89	0 N 04	23 S 23	269.87	77.50	-32.93
SATURN	5 VI 16	155.27	1 N 26	10 N 55	157.63	34.74	14.03
URANUS	29 GE 56	89.93	0 N 12	23 N 39	89.93	77.56	33.40
NEPTUNE	14 LI 08	194.13	1 N 31	4 S 10	193.60	1.23	- 5.25
PLUTO	16 LE 34	136.56	7 N 33	23 N 04	141.49	50.88	32.37
CHIRON	28 SC 14	238.23	3 N 10	16 S 42	236.71	44.34	-22.16
COMET*	17 LI 57	197.96	21 S 13	26 S 31	187.69	4.68	-38.85
NODE	4 TA 58	34.96		13 N 11	32.68	20.31	17.13
ASC	5 LE 30	125.50		18 N 54	127.86	64.51	25.49
MC	13 AR 27	13.44		5 N 18	12.37		6.70
VTX	23 SG 00	263.00		23 S 15	262.38	70.01	

*Comet 1948 XI (magnitude 3)

	D/N SA*	OA/D**	AD_2	OA/D_2
SUN	114.70	205.31	-15.33	245.34
MOON	104.46	14.01	9.09	37.56
MERCURY	105.73	199.49	- 9.87	225.09
VENUS	96.02	189.77	- 3.80	199.59
MARS	124.16	225.92	-20.81	280.89
JUPITER	122.93	236.94	-20.12	289.99
SATURN	75.97	143.60	8.82	166.45
URANUS	123.40	56.53	20.39	110.32
NEPTUNE	95.25	188.35	- 3.32	196.92
PLUTO	57.63	109.12	19.80	161.29
CHIRON	112.16	214.55	-13.81	250.52
COMET	128.85	226.54	-23.38	164.31
NODE	107.13	15.55	10.74	43.42
ASC	115.49	102.37		
MC	96.70	5.67	4.23	8.14
VTX			-19.98	282.37

*DSA if body above horizon, NSA if body beneath horizon
**OA if body east of meridian, OD if body west of meridian

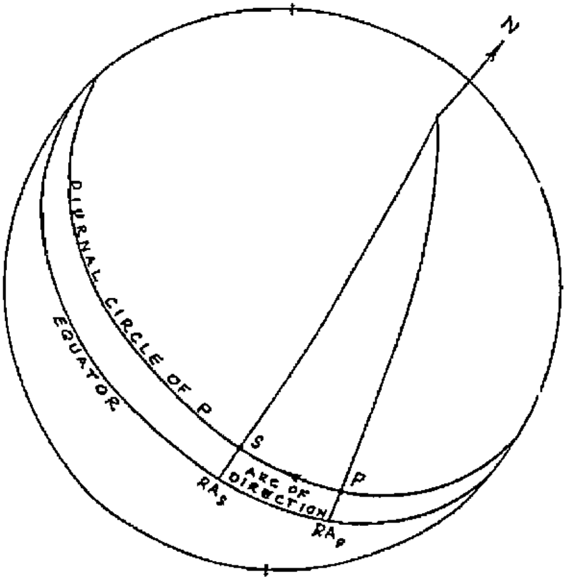

Figure II-1

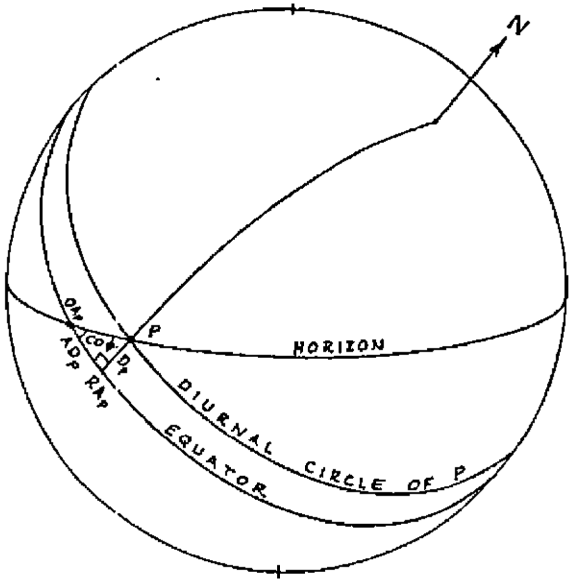

Figure II-2

CHAPTER II: DIRECTIONS TO THE ANGLES;

TYPES OF DIRECTIONS

PROMISSOR AND SIGNIFICATOR

In a primary direction a planetary or stellar body is conceived of as moving along its diurnal circle from its initial position at birth to a position where another body or aspect point existed at birth. For the purpose of measurement these positions are projected onto the equator with hour circles (Figure II-1).

The moving body in a primary direction is termed the promissor; its position is referred to universal space. The natal body or point to which the promissor is directed is termed the significator; its position is referred to local space.*

ARC OF DIRECTION

The arc through which the promissor must move along its diurnal circle to reach the Mundane Position of the significator is termed the arc of direction, which is measured along the equator in right ascension. That is to say, the arc of direction equals the promissor's natal RA minus the RA of the point on promissor's diurnal circle which is conjunct the significator. The arc of direction is then converted into time to yield the native's age when the direction will operate. Roughly, each degree of RA in the arc of direction equates to one year of life.

In the notation for a primary direction the promissor is written first and the significator last. For example JU CONJ SU means that Jupiter is the promissor and the sun is the significator: Jupiter is moved by diurnal rotation to the position occupied by the sun at birth.

DIRECTIONS TO THE MC AND IC

The simplest directions to calculate are those in which the MC or IC is the significator. In this case the arc of direction equals the RA of the promissor minus the RAMC (or RAIC). That is, the arc of direction of a promissor to the MC or IC is equal to the meridian distance of the promissor.

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*Some authors reverse this nomenclature.

Example: If RAMC = 12.37 and RAIC = 192.37, then
MO CONJ MC mund d: RA_{MO} = 28.47; Arc = 28.47 - 12.37 = 16.10
SU CONJ IC mund d: RA_{SU} = 230.01; Arc = 230.01-192.37 = 37.64
SA CONJ IC mund c: RA_{SA} = 157.63; Arc = 157.63-192.37 = -34.74
CO CONJ IC mund c: RA_{CO} = 187.69; Arc = 187.69-192.37 = -4.68

CONVERSE AND DIRECT DIRECTIONS

In the last two examples above the promissors were directed to the significator (IC) in a counterclockwise direction, i.e. against the direction of rotation of the celestial sphere, so that the arcs of direction are negative. These are nonetheless considered to be valid primary directions, and are termed converse directions to distinguish them from direct directions in which the promissor moves clockwise, in the direction of rotation of the celestial sphere.* The complete specification of a primary direction lists the promissor, aspect, significator, type, and then a "c" or "d" to indicate whether the direction is converse or direct.

DIRECTIONS TO THE ASCENDANT

Directions to the MC and IC are the simplest because the Mundane Positions of these significators are their RA's. Directions to the Ascendant and Descendant are more complex because the Mundane Positions of these significators are defined on the horizon but measured on the equator. A body's Mundane Position with respect to the eastern horizon is termed its **oblique ascension** (OA), which is that point on the equator which rises at the same time as the body, i.e. the East point at the moment the body transits the eastern horizon. The term OA is also used to mean the RA of this point. In Figure II-2 body P is shown at the moment of rising. OA_P is the intersection of the horizon and the equator. Comparison of Figure II-2 with Figure I-13 will show that the arc in RA between OA_P and RA_P is equal to AD_P, the ascensional difference of P. Then the arc of direction of P CONJ ASC is the arc along the equator from the OA of the natal Ascendant to the OA of the body, i.e., the difference between the RA of the East point at birth and the RA of the East point when body P rises.

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*Some authors reverse this nomenclature, particularly with regard to zodiacal directions.

The algorithm for directing promissors to conjunction with the Ascendant is:

Formula II-1: 1. Compute the OA of the Ascendant at birth:

$$OA_{ASC} = RAMC + 90$$

2. Compute the OA of the promissor:

$$OA_P = RA_P - AD_P$$

where RA_P is the RA of the promissor and AD_P is its ascensional difference (from Formula I-1).

3. Computethe Arc of Direction P CONJ ASC:

$$Arc = OA_P - OA_{ASC}$$

The arc of direction is positive if the direction is direct, and negative if it is converse.

Example: $OA_{ASC} = 12.37 + 90 = 102.37$
PL CONJ ASC mund d: $OA_{PL} = RA_{PL} - AD_{PL} = 141.49 - 32.37 = 109.12$
$Arc = OA_{PL} - OA_{ASC} = 109.12 - 102.37 = 6.75$
UR CONJ ASC mund c: $OA_{UR} = RA_{UR} - AD_{UR} = 89.93 - 33.40 = 56.53$
$Arc = OA_{UR} - OA_{ASC} = 56.53 - 102.37 = -45.84$

DIRECTIONS TO THE DESCENDANT

In a similar fashion bodies are directed to the Descendant using Mundane Position with respect to the western horizon, known as oblique descension (OD). Oblique descension of a body is given by OD = RA + AD. To direct promissors to conjunction with the Descendant:

Formula II-2: 1. Compute the OD of the Descendant at birth:

$$OD_{DESC} = RAMC - 90$$

2. Compute the OD of the promissor:

$$OD_P = RA_P + AD_P$$

where RA_P is the RA of the promissor and AD_P is its ascensional difference (from Formula I-1).

3. Compute the Arc of Direction P CONJ DESC:

$$Arc = OD_P - OD_{DESC}$$

Example: $OD_{DESC} = 12.37 - 90 = 282.37$
JU CONJ DESC mund c: $OD_{JU} = RA_{JU} + AD_{JU} = 269.87 + (-32.93) =$
236.94; $Arc = OD_{JU} - OD_{DESC} = 236.94 - 282.37 = -45.43$

DIRECTIONS TO THE ANTIVERTEX

Promissors may be directed to the Antivertex and Vertex in an analogous manner, using Mundane Position with respect to the prime vertical, known as oblique ascension (or descension) type 2 (OA_2, OD_2). In Figure II-3 body P is shown at the moment it transits the prime vertical. OA_{2P} is the East point (and its RA) at this moment. The arc along the equator from RA_P to OA_{2P} is the ascensional difference type 2 (AD_{2P}) of P. AD_{2P} can be computed from the triangle whose sides are arcs of the prime vertical, the equator (= AD_{2P}), and the hour circle through P (= D_P). The angle between the prime vertical and the equator equals Ø. Then by Rule 10,

Formula II-3: AD_2 = Arcsin (tan D cot Ø)

And $OA_2 = RA + AD_2$.

To direct a promissor to conjunction with the Antivertex:

Formula II-4:

1. Compute the OA_2 of the Antivertex at birth:

$OA_{2AVTX} = RAMC + 90$

2. Compute the OA_2 of the promissor:

$OA_{2P} = RA_P + AD_{2P}$

where RA_P is the RA of the promissor and AD_{2P} is its ascensional difference type 2 (from Formula II-3).

3. Compute the Arc of Direction P CONJ AVTX:

Arc = $OA_{2P} - OA_{2AVTX}$

Example: OA_{2AVTX} = 12.37 + 90 = 102.37

PL CONJ AVTX mund d:

$OA_{2PL} = RA_{PL} + AD_{2PL}$ = 141.49 + 19.80 = 161.29

Arc = 161.29 - 102.37 = 58.92.

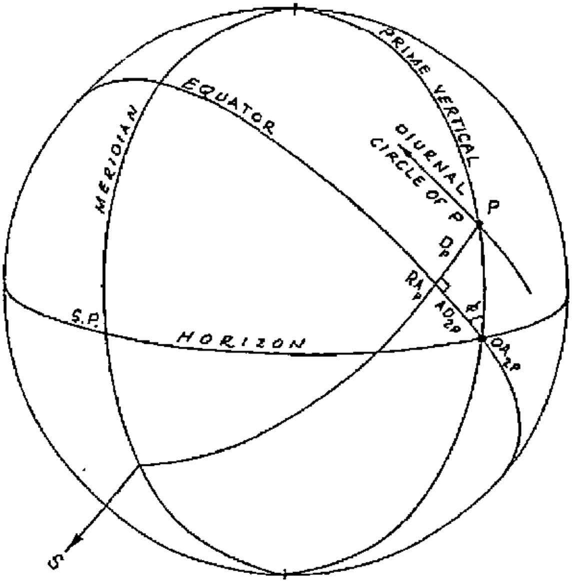

Figure II-3

DIRECTIONS TO THE VERTEX

To direct a promissor to conjunction with the Vertex:

Formula II-5: 1. Compute the OD_2 of the Vertex at birth:

$OD_{2VTX} = RAMC - 90$

2. Compute the OD_2 of the promissor:

$OD_{2P} = RA_P - AD_{2P}$

where RA_P is the RA of the promissor and AD_{2P} is its ascensional difference type 2 (from Formula II-3).

3. Compute the Arc of Direction P CONJ VTX:

Arc = $OD_{2P} - OD_{2VTX}$

Example: OD_{2VTX} = 12.37 - 90 = 282.37

JU CONJ VTX mund d: $OD_{2JU} = RA_{JU} - AD_{2JU}$ = 269.87 - (-20.12) = 289.99; Arc = 289.99 - 282.37 = 7.62

PRIME VERTICAL SEMI-ARCS

Note that it is possible to define an analogy of the semi-arcs of a body as the portions of the body's diurnal circle intercepted by the meridian and the prime vertical (instead of the horizon). These semi-arcs of type 2 are given by:

$DSA_2 = 90 - AD_2$ (south of the prime vertical)

$NSA_2 = 90 + AD_2$ (north of the prime vertical)

where AD_2 is the ascensional difference type 2. The point is that any house system defined in terms of horizon semi-arcs (e.g. Placidus, Alcabitius, Koch) gives rise to a mirror-image house system defined in terms of prime vertical semi-arcs. Similarly, house systems (such as Koch) which project with ascension circles can be redefined using ascension circles type 2 (great circles tangent to the diurnal circles through the zenith and nadir). This point is mentioned merely for the sake of completeness and has no bearing upon anything which follows.

MUNDANE AND ZODIACAL DIRECTIONS

In all the preceding examples the promissors were directed to the meridian, horizon, or prime vertical bodily, in mundo. The calculation for the arc of direction gives the actual lapse in time between the moment of birth and the moment of the body's culmination (if MC is significator), anticulmination (IC), rising (ASC), setting (DESC), or transit of the prime vertical (VTX, AVTX), measured in degrees rather than hours. These are termed mundane directions and are the only astronomically valid primary directions because they are based on the promissor's actual location at birth.

There is a second class of primary directions in common usage*, however, which is based not on the actual position of the promissor but rather the position of the promissor projected onto the ecliptic. This type of primary direction is called a zodiacal direction.

ZODIACAL DIRECTIONS TO THE MC AND IC

To direct a promissor to the MC or IC in zodiaco, the arc of direction equals the RA of the zodiacal longitude of the promissor minus the RAMC (or RAIC). The RA of the zodiacal longitude of promissor is found from Appendix Formula A2.

Example: If RAMC = 12.37 and RAIC = 192.37 then

MO CONJ MC zod d: by Formula A2, the RA of 0 TA 26 = 28.32;
Arc = 28.32 - 12.37 = 15.95

SU CONJ IC zod d: by Formula A2, the RA of 22 SC 25 = 230.01;
Arc = 230.01 - 192.37 = 37.64

CO CONJ IC zod d: by Formula A2, the RA of 17 LI 57 = 196.55;
Arc = 196.55 - 192.37 = 4.18

---

*In fact zodiacal directions are much more widely employed than are mundane directions.

Note that the arc of direction of SU CONJ IC is the same in both the mundane and zodiacal modes of calculation. This is because the sun, by definition, is a point on the ecliptic. Any promissor lying exactly on the ecliptic (with zero celestial latitude) will have identical mundane and zodiacal arcs of direction. By contrast, the mundane and zodiacal arcs of direction of CO CONJ IC differ by almost nine degrees, reflecting the fact that the comet has 21 degrees of southern celestial latitude; moreover, the two arcs are of opposite sign (mundane converse and zodiacal direct), reflecting the fact that the body of the comet anticulminated before the longitude of the comet did, so they are on opposite sides of the meridian.

ZODIACAL DIRECTIONS TO THE ASCENDANT AND DESCENDANT

Zodiacal directions to the Ascendant and Descendant are computed as follows: the RA and declination of the degree of longitude occupied by the promissor must be calculated from Formula A2 (L to RA) and Formula A4 (L to D). The AD of this ecliptic point must be calculated from Formula I-1 with this new declination; then the oblique ascension (or descension) of the point and the arc of direction are calculated from Formula II-1 (or Formula II-2), using the RA_P and AD_P of the ecliptic point obtained above.

Example: OA_{ASC} = 102.37 and OD_{DESC} = 282.37

PL CONJ ASC zod d: by Formula A2, the RA of 16 LE 34 = 139.02; by formula A4, the declination of 16 LE 34 = 15.88; by Formula I-1, the AD of 16 LE 34 = 20.95; OA = RA - AD = 139.02 - 20.95 = 118.07; Arc = OA - OA_{ASC} = 118.07 - 102.37 = 15.70

JU CONJ DESC zod c: the RA of 29 SG 53 = 269.87; the declination of 29 SG 53 = -23.45; the AD of 29 SG 53 = -33.04; OD = RA + AD = 269.87 + (-33.04) = 236.83; Arc = OD - OD_{DESC} = 236.83 - 282.37 = -45.54.

ZODIACAL DIRECTIONS TO THE ANTIVERTEX AND VERTEX

Zodiacal directions to the Antivertex and Vertex are computed similarly: the RA and declination of the degree of longitude occupied by the promissor are calculated from Formulas A2 and A4; then the AD_2 of this ecliptic point is calculated from Formula II-3. The RA and AD_2 so obtained are used in Formula II-4 (or Formula II-5) to obtain the OA_2 (or OD_2) of the ecliptic point and the arc of direction.

Example: OA_{2AVTX} = 102.37 and OD_{2VTX} = 282.37

PL CONJ AVTX zod d: the RA of 16 LE 34 = 139.02; the declination of 16 LE 34 = 15.88; the AD_2 of 16 LE 34 = 13.08;
OA_2 = 139.02 + 13.08 = 152.10; Arc = 152.10 - 102.37 = 49.73

JU CONJ VTX zod d: the RA of 29 SG 53 = 269.87; the declination of 29 SG 53 = -23.45; the AD_2 = -20.18; OD_2 = 269.87 - (-20.18) = 290.05; Arc = 290.05 - 282.37 = 7.68

ASPECTUAL DIRECTIONS

In a **mundane aspectual direction** the promissor is directed to a point in mundane aspect to the significator, i.e., the number of degrees in the aspect is added to the significator's Mundane Position to obtain the Mundane Position of the aspect point. Actually it is more correct to say that this mundane aspect point is the significator. For example, the Ascendant is mundanely square the MC (in most house systems), hence MO CONJ MC mund d is equivalent to MO SQR ASC mund d. The significator in the former case is the MC, and in the latter case it is "SQR ASC." Thus in a mundane aspectual direction the aspect is considered to be part of the significator

In a **zodiacal aspectual direction** a zodiacal aspect of the promissor (an ecliptic point) is directed to mundane conjunction with the significator, i.e., the number of degrees in the aspect is added to the promissor's longitude to obtain the longitude of the aspect point. It is more correct to say that this zodiacal aspect point is the promissor. For example, in the direction MO SQR ASC zod c, the ecliptic point of longitude 0 LE 26 (the square to the moon's natal longitude) is directed to mundane conjunction with the Ascendant. In this case "SQR MOON" is the promissor. Thus in a zodiacal aspectual direction the aspect is considered to be part of the promissor.

However, the terms "promissor" and "significator" will be used to denote the respective bodies involved in the direction as well as the aspect points to these bodies, in spite of the fact that this usage is not strictly accurate. The context will determine in each case which sense of the term "promissor" or "significator" is being applied.

FIELD PLANE DIRECTIONS

Another type of primary direction employed by some practitioners is termed a **field plane direction.** Where zodiacal directions are computed using the longitude of the promissor and zero celestial latitude (i.e. the sun's celestial latitude), field plane directions are computed using the longitude of the promissor and the celestial latitude of any other planet or body in the horoscope. Usually field plane directions are calculated only for the field planes (using the celestial latitudes) of the promissor or the significator, or else the celestial latitude which the promissor will have when next it arrives at the longitude of the aspect point.

Example: MO SQR ASC c in the field plane of the moon when next it arrives at the aspect point: the moon next reaches 0 LE 26 on 21 November 1948, at which time its celestial latitude is 5 N 11. The declination of the aspect point (25.12) is computed from Formula A5 using a longitude of 0 LE 26 and a celestial latitude of 5 N 11. Then the RA of the aspect point (123.86) is computed from Formula A6. The AD of the aspect point (36.12) is computed from Formula I-1, and the OA (87.74) and the arc of direction (-14.63) are computed from Formula II-1.

CHAPTER III: EQUATING ARCS OF DIRECTION TO TIME

Once the arc of direction of a primary direction has been obtained, it is necessary to determine when that direction will operate in the native's life. Several methods have been proposed for equating arcs of direction to time:

PTOLEMY'S METHOD

In Ptolemy's method each degree of RA in the arc of direction corresponds to one year of life.

Example: Birth year = 1948 + (319 / 366) = 1948.872
MO CONJ MC mund d: Arc = 16.10; 16.10 + 1948.872 = 1964.972 = 21 December 1964.
JU CONJ DESC zod c: Arc = -45.54*; 45.54 + 1948.872 = 1994.412 = 30 May 1994.

NAIBOD'S METHOD

In Naibod's method each degree of RA in the arc of direction corresponds to 1.0146 years of life (365.25 days / 360 degrees); i.e., the sun's mean daily motion in RA represents one year of life.

Example: MO CONJ MC mund d: Arc = 16.10; 16.10 x 1.0146 = 16.335 years; 16.335 + 1948.872 = 1965.207 = 17 March 1965.
JU CONJ DESC zod c: Arc = -45.54; 45.54 x 1.0146 = 46.205 years; 46.205 + 1948.872 = 1995.077 = 28 January 1995.

SIMMONITE'S METHOD

In Simmonite's method (Birthday arc) the sun's travel in RA on the birthday represents one year of life. Thus the age (in years) when the direction operates is equal to the arc of direction divided by the sun's travel in RA on the birthday. For example, the sun's RA at midnight GMT on 14 November 1948 was 229.105 (computed from Formula A2 and the solar longitude position in the ephemeris) and the sun's RA at midnight GMT on 15 November 1948 was 230.130. Thus the sun's travel in RA on the birthday was 230.130 - 229.105 = 1.025 degrees.

*Converse arcs are here treated as direct arcs, i.e., the absolute value of the arc of direction is equated to time. However it has also been suggested that in the case of the True Solar Arc in RA measure, the absolute value of a converse arc be subtracted from the RA of natal sun, and the direction timed by the converse secondary progressed sun.

Example: MO CONJ MC mund d: Arc = 16.10; 16.10 / 1.025 =
15.707 years; 15.707 + 1948.872 = 1964.579 = 30 July 1964.
JU CONJ DESC zod c: Arc = -45.54; 45.54 / 1.025 =
44.429 years; 44.429 + 1948.872 = 1993.301 = 20 April 1993.

PLACIDUS' METHOD (TRUE SOLAR ARC IN RA)

In Placidus' method (True Solar Arc in RA) the sun's travel in RA each day after birth represents the corresponding year of life, e.g., the sun's travel in RA in the ten days after birth represents the first ten years of life.

Here the arc of direction is added to the sun's natal RA, and the sum is converted to longitude with Formula A3. The ephemeris for the year of birth is consulted to ascertain the lapse in days (and fractions) from birth until the sun attained this longitude. Then the result is converted to years of life at the rate of a day for a year. In other words, the True Solar Arc method is timed by the motion in RA of the secondary progressed sun. The True Solar Arc in RA method is overwhelmingly the most popular method in use by modern practitioners of primary directions (de Luce, Jayne, et. al.).

Example: MO CONJ MC mund d: Arc = 16.10; RA_{SU} = 230.01;
16.10 + 230.01 = 246.11; from Formula A3, this RA corresponds to a longitude of 247.89 = 7 SG 53; from the ephemeris, the sun attained this longitude on 30 November 1948 at 4:52 GMT, which is 15 days, 7.62 hours = 15.318 days after birth; 15.318 + 1948.872 = 1964.190 = 10 March 1964.

JU CONJ DESC zod c: Arc = -45.54; 45.54 + 230.01 = 275.55; from Formula A3, this RA corresponds to a longitude of 275.09 = 5 CP 05; from the ephemeris, the sun attained this longitude on 26 December 1948 at 22:16 GMT, which is 42 days, 1.02 hours = 42.043 days after birth; 42.043 + 1948.872 = 1990.915 =
30 November 1990.

TRUE SOLAR ARC IN RA ALGORITHM

Another way of calculating the date when a primary direction will operate according to the True Solar Arc in RA method (which is more adaptable to computers) is as follows:

1. Compute the Julian Date of Birth:

$$JD = 367\ Y - \text{int}\ (1.75\ (Y + \text{int}\ ((M + 9) / 12))) + 1721014 + \text{int}\ (275\ M / 9) + D + G / 24 - .5\ \text{sgn}\ (100\ Y + M - 190002.5)$$

where Y is the birth year ($1900 < Y < 2000$), M is the birth month ($1 \leq M \leq 12$), D is the birth day ($1 \leq D \leq 31$), G is the GMT of birth (in hours and decimals), int is the integer part (or greatest integer) function and sgn is the sign function (returns a value of -1 for arguments less than zero and a value of 1 for arguments greater than or equal to zero).

Example: Birth on 14 November 1948 at GMT = 21 h 14 m 39 s
Y = 1948; M = 11; D = 14; G = 21.244
JD = 714916 - 3410 + 1721014 + 336 + 14 + .885 - .5 = 2432870.385

2. Let $PR = RA_{SU} + A$, where RA_{SU} is the RA of the natal sun and A is the absolute value of the arc of direction.
Let PL = the longitude corresponding to PR from Formula A3. Note that if PR exceeds 360, then PL should exceed 360 as well.

3. Let $L = PL + 360\ (Y - 1900)$, where Y is the birth year.

4. Let the starting value of T be:

$$T = (JD + A - 2415020)\ /\ 36525$$

where JD is the Julian Date of birth and A is the absolute value of the arc of direction.

5. Let $Z = 358.476 + 35999.05\ T$

6. Let $T = \dfrac{(L - 279.691 - 1.919 \sin Z - .02 \sin 2\ Z)}{(36000.769 - .0048 \sin Z)}$

Then recycle this new value of T back through Step 5 until successive iterations are sufficiently constant (within a difference of 10^{-7}).

7. Let $DY = 36525\ T + 2415020 - JD$

If $DY < 0$ then add 365.2422 to it. DY is days (and decimal fractions) from birth until the secondary progressed sun reached longitude PL, i.e., years (and decimal fractions) from birth until the arc of direction operates. Hence the date when the primary direction operates is given by: $PY = Y + DN/365 + DY$, where Y is the birth year and DN is the day number of the birthday, given by:

$DN = \text{int}\ (275\ M\ /\ 9) + D - 30 -$
$\quad \text{int}\ ((M + 9)\ /\ 12) \times (1 + \text{int}\ ((Y + 2 - 4\ \text{int}\ (Y\ /\ 4))\ /\ 3))$

Example: $Y = 1948$; $M = 11$; $D = 14$
$DN = 336 + 14 - 30 - 1 \times (1 + 0) = 319$

This True Solar Arc in RA algorithm is accurate to within a minute or so of arc, i.e., within a week or so in the primary directions.

Example: MO CONJ MC mund d: Arc = 16.10; RA_{SU} = 230.01;
PR = 246.11; PL = 247.89; L = 17527.885; initial T = .4891577;
successive iterations:

Z	T
17967.68851	.47913522
17606.88908	.47913586
17606.91182	.47913584

DY = 15.294; PY = 15.294 + 1948.872 = 1964.166 = 2 March 1964

JU CONJ DESC zod c: Arc = -45.54; PR = 275.55; PL = 275.09;
L = 17555.09; initial T = .4899637; successive iterations:

Z	T
17996.70458	.47986506
17633.16259	.47986841
17633.28302	.47986830
17633.27894	.47986830

DY = 42.047; PY = 1990.919 = 2 December 1990

ASCENDANT AND VERTICAL ARCS

The foregoing methods of equating arcs of direction to time are based upon motion measured in right ascension across the midheaven. The MC is the chronometer; it is advanced in RA from its birth position at the rate of the given measure.

For the True Solar Arc in RA method, however, it is equally correct to say that the midheaven is advanced in longitude at the same rate as the progressed sun. This suggests the possibility of utilizing the other angles as chronometers as well as the MC (Jayne I), i.e., advancing the Ascendant and Vertex at the same rate in longitude as the progressed sun. In the case of the Ascendant this means regarding the arc of direction as a measure between two OA (rather than RA) positions on the celestial equator, and in the case of the Vertex it means regarding the arc of direction as a measure between two OD_2 positions. Naturally, the Descendant and Antivertex have their own measures in OD and OA_2, but these will not be considered here.

ASCENDANT ARC MEASURE

To find the time when a primary direction will operate using the ascendant arc measure:

1. Add absolute value of the arc of direction to the RAMC to obtain the progressed RAMC.

2. From a table of houses for the latitude of the birthplace or from Formula A8 compute the progressed Ascendant for this progressed RAMC.

3. Subtract the longitude of the natal Ascendant from the longitude of the progressed Ascendant. Add the difference to the sun's natal longitude. If this sum exceeds 360, do not subtract 360 from it if the True Solar Arc in RA algorithm is to be used.

4. From an ephemeris for the year of birth, find the lapse in days (and fractions) from birth until the sun attained this longitude. Then convert the result into years of life at the rate of a day for a year. Or, use the True Solar Arc in RA algorithm, letting A equal the longitude arc and PL the final longitude obtained in Step 3 above.

Example: MO CONJ MC mund d: Arc = 16.10; progressed RAMC = 12.37 + 16.10 = 28.47; progressed Ascendant = 136.84 (16 LE 50); progressed ASC - natal ASC + natal L_{SU} = 136.84 - 125.50 + 232.42 = 243.76; entering the True Solar Arc in RA algorithm with PL = 243.76 and A = 136.84 - 125.50 = 11.34, L = 17523.76; initial T = .4890274; final T = .47902433; DY = 11.221; PY = 1960.093 =
3 February 1960

Since the rising sign in this case (Leo) is of long ascension, the Ascendant arc here falls considerably short of the corresponding arc in RA.

VERTICAL ARC MEASURE

To find the time when a primary direction will operate using the vertical arc measure:

1. Add the absolute value of the arc of direction to the natal RAIC to obtain the progressed RAMC.

2. From a table of houses for the colatitude of the birthplace or from Formula A8 (using co ϕ in place of ϕ) compute the progressed Vertex for this progressed RAMC.

3. Subtract the longitude of the natal Vertex from the longitude of the progressed Vertex. Add the difference to the sun's natal longitude. Thence proceed as for the Ascendant arc.

Example: MO CONJ MC mund d: Arc = 16.10; progressed RAMC = 192.37 + 16.10 = 208.47; progressed Vertex = 277.83 (7 CP 49); progressed VTX - natal VTX + L_{SU} = 277.83 - 263.00 + 232.42 = 247.25; entering the True Solar Arc in RA algorithm with PL = 247.25 and A = 14.83 gives DY = 14.667; PY = 1963.539 = 16 July 1963

CHAPTER IV: THE CAMPANUS AND REGIOMONTANUS SYSTEMS

DEFINING "CONJUNCTION"

In a primary direction the arc of direction is the arc measured along the equator from the promissor's natal RA position to the RA of that point on promissor's diurnal circle which is conjunct the significator. However, unless the promissor and significator have equal declinations (as they do in Figure II-1) and thus share the same diurnal circle, no true conjunction can occur; the promissor will "pass" above or below the significator's location at birth. Therefore a more generalized definition of conjunction is needed to direct points on the celestial sphere to one another (as opposed to directing them to a great circle such as the meridian, horizon, or primo vertical).

There are various ways in which conjunction and Mundane Position can be (and have been) defined, and in fact every horoscope house system gives rise to its own definition of Mundane Position and its own system of primary directions. This can be most clearly illustrated in the case of projection house systems (the most common type).

MUNDANE POSITION IN PROJECTION HOUSE SYSTEMS

In a projection house system some circle is divided into twelve (usually) 30 degree arcs by a set of six projection circles. The circle being divided need not be a great circle, but the projection circles must be great circles. The twelve points where these six projection circles intersect the ecliptic measure the longitudes of the twelve house cusps. In a projection house system two points are considered to be conjunct (or have the same Mundane Position) if they are projected onto the same point of the circle being divided into twelve. That is, two points are conjunct if they lie on the same projection circle.

The numerical Mundane Position of a point is expressed in terms of degrees of arc measured along the circle being divided into twelve, from a given reference point to the intersection with the projection circle through the point.

MUNDANE ASPECTS

A point is considered to be in mundane aspect to a significator if the arc along the circle being divided into twelve from the intersection with the projection circle through the significator to the intersection with the projection circle through the point equals the number of degrees in the aspect (60, 90, 120, etc.). That is to say, the numerical Mundane Position of the aspect point equals the numerical Mundane Position of the significator plus the number of degrees in the aspect.

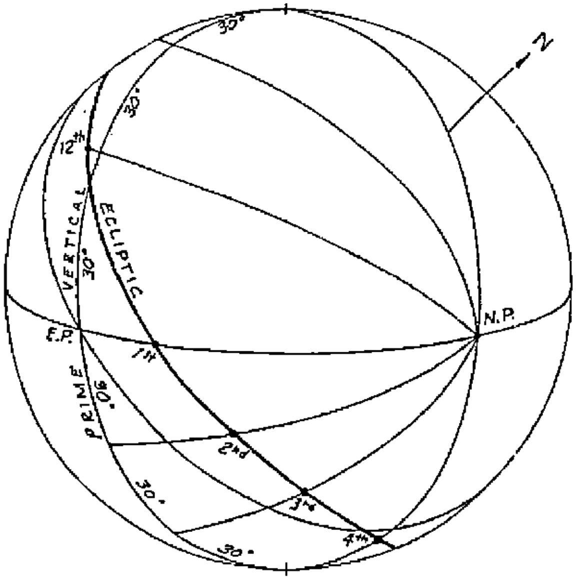

Figure IV-1

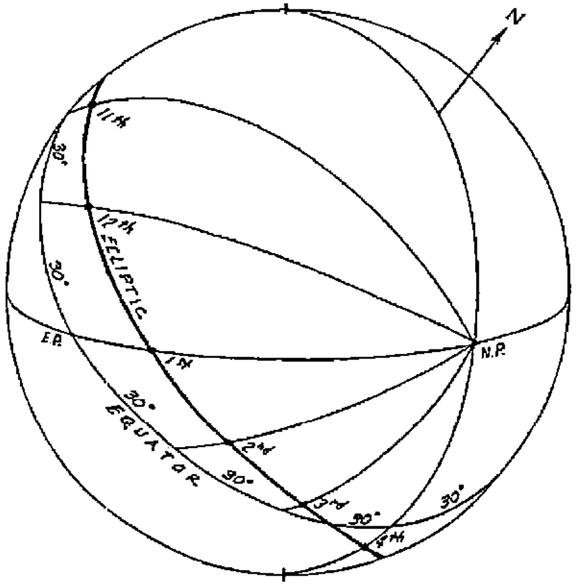

Figure IV-2

W, Q, POLE, AND COPOLE

The **W** of a significator is the point of intersection of the celestial equator with the projection circle passing through the significator (on the same side of the meridian as the significator). "W" is also used to mean the RA of this point.

The **Q** of a significator is the arc (and its measure) along the equator between the significator's W and its RA. The Q_p of a promissor is the arc (and its measure) along the equator between the significator's W and the RA of the intersection of the projection circle passing through the significator and the promissor's diurnal circle.

The **pole** of a significator is the measure of the perpendicular arc from the celestial pole to the projection circle passing through the significator.

The **copole** of a significator is the angle between the equator and the projection circle passing through the significator (which intercepts the significator's declination arc). Copole is numerically equal to 90 - pole (if pole > 0) and to - pole - 90 (if pole < 0).

The foregoing concepts are most clearly elucidated by reference to concrete examples of primary directions in projection house systems, and such examples comprise the present chapter and the following two chapters of this book.

THE CAMPANUS SYSTEM

In the Campanus house system (Figure IV-1) the prime vertical is divided into twelve 30 degree arcs (beginning at the East point) by six **house circles**, great circles passing through the North and South points on the horizon. Where these house circles intersect the ecliptic measure the longitudes of the Campanus house cusps.

THE REGIOMONTANUS SYSTEM

In the Regiomontanus house system (Figure IV-2) the celestial equator is divided into twelve 30 degree arcs (beginning at the East point) by six house circles. Where these house circles intersect the ecliptic measure the longitudes of the Regiomontanus house cusps.

In both the Campanus and Regiomontanus systems, two points are considered to be conjunct (or have the same Mundane Position) if they lie on the same house circle; i.e., the locus of points having the same Mundane Position as a given point is the great circle passing through the given point and the North and South points on the horizon (Figure IV-3).

POLE AND COPOLE

Define the **pole** (or **polar elevation**) of a body S to be the measure of the perpendicular arc from the north (or south) celestial pole to the house circle passing through S. Pole varies in value from zero (for a body lying on the meridian) to Ø (for a body lying on the horizon).

Define the copole of a body S to be the angle between the equator and the house circle passing through S (which intercepts the declination arc of S, D). The copole is numerically equal to 90 - pole if $\phi > 0$ and - pole - 90 if $\phi < 0$. Evidentally, the copole varies in value from 90 (for a body lying on the meridian) to co ϕ (for a body lying on the horizon).

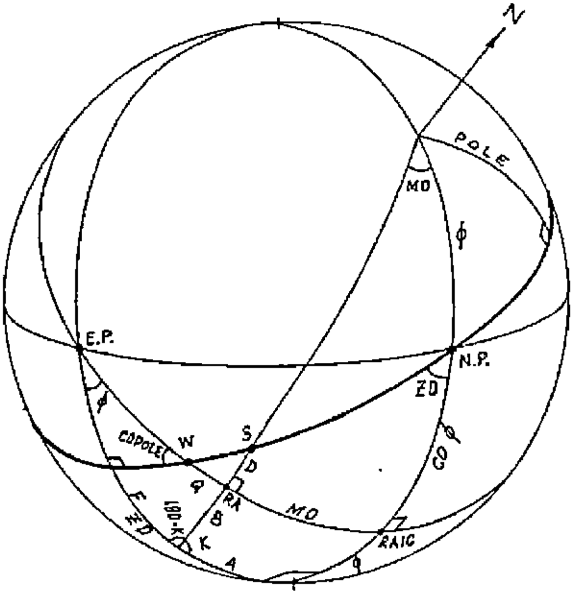

Figure IV-3

W AND Q

The point where the house circle through the body intersects the equator is termed the body's **oblique ascension (or descension) under its own pole (W).** It is termed OA under own pole when the body lies east of the meridian and OD under own pole when it lies west of the meridian. Oblique ascension or descension under own pole is the Regiomontanus numerical Mundane Position of the body.

The difference between the RA and W of a body is termed its **ascensional difference under its own pole (Q).** By Rule 10,

$$\sin Q = \tan D \cot \text{copole} \qquad \text{or}$$

Formula IV-1: $$Q = \text{Arcsin} (\tan D \tan \text{pole})$$

where D is the declination of the body. Observe that Q is negative when declination and pole are of opposite signs.

ZENITH DISTANCE

To compute the pole of a body it is necessary first to compute its zenith distance (ZD), which is the arc measured along the prime vertical from the zenith (or nadir) to the point of intersection with the house circle passing through the body. Equivalently, ZD is the angle between the meridian and the house circle through the body. When normalized on a scale of 0 to 360, zenith distance is the Campanus numerical Mundane Position of the body.

Figure IV-4 is a view of the 1st and 4th Quadrants of the celestial sphere projected onto the meridian so the North and South celestial poles appear as points on the circumference and the East point is the center of the circle. There are ten possible locations for a body in the 1st Quadrant, viz.:

1. on the horizon south of the prime vertical;
2. between the horizon and the hour circle through the East point;
3. on the hour circle through the East point;
4. between the hour circle through the East point and the prime vertical;
5. on the prime vertical;
6. between the prime vertical and the equator;
7. on the equator;
8. between the equator and the northern horizon (this case is illustrated in Figure IV-3);
9. on the horizon north of the prime vertical;
10. on the meridian.

Consider case 8, with the body located at point S in Figure IV-3. In this case MD = LMD since the body lies on the same side of the hour circle through the East point as the RAIC.

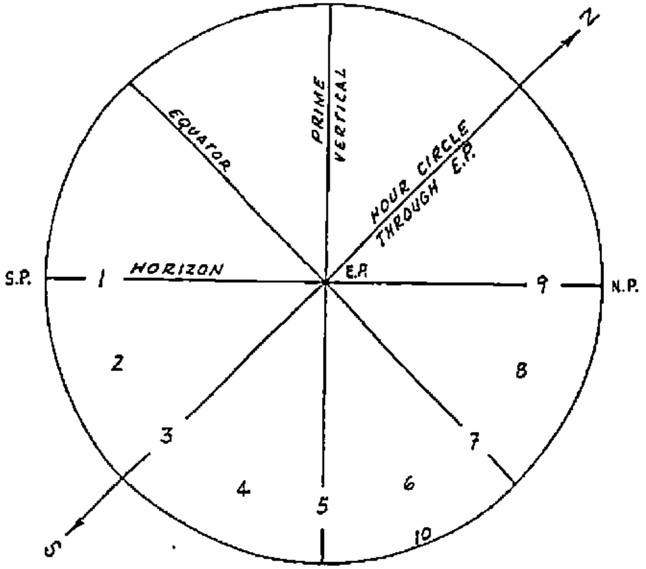

Figure IV-4

Consider the triangle whose sides are arcs of the meridian, prime vertical, and hour circle through the body. The side which is an arc of the meridian is equal to 90 + ϕ. The opposite angle (between the prime vertical and hour circle) will be called K. The angle between the meridian and hour circle is equal to the MD of the body. Call the opposite side (the arc of the prime vertical) A. Then by Rule 9,

$$\sin (90 + \phi) = \tan A \cot MD \quad \text{or}$$

$$A = \text{Arctan} (\cos \phi \tan MD)$$

By Rule 4,

$$\cos K = \cos (90 + \phi) \sin MD \quad \text{or}$$

$$\cos K = -\sin \phi \sin MD$$

Consider the triangle whose sides are arcs of the equator, prime vertical, and hour circle through the body. The side which is an arc of the equator is equal to the co MD (90 - MD) of the body. The angle between the equator and prime vertical is equal to ϕ. The opposite side (the arc of the hour circle through the body) will be called B. Then by Rule 10,

$$\sin \text{co } MD = \tan B \cot \phi \quad \text{or}$$

$$B = \text{Arctan} (\tan \phi \cos MD)$$

Consider the triangle whose sides are arcs of the prime vertical, the hour circle through the body, and the house circle through the body. The hypotenuse (arc of the hour circle from the prime vertical to the body) will be called C. C is numerically equal to $B + D$, where D is the declination of the body. The angle between the prime vertical and the hour circle is equal to $180 - K$. The arc of the prime vertical will be called F. Then by Rule 7, $\cos(180 - K) = \tan F \cot C$, and substituting for $-\cos K$, $\sin \emptyset \sin MD = \tan F \cot C$ or

$$F = \text{Arctan}\,(\sin \emptyset \sin MD \tan C)$$

Finally, the zenith distance (arc of the prime vertical from the nadir to the intersection with the house circle) is given by:

$$ZD = A + F$$

ZD ALGORITHM

The general algorithm for computing the zenith distance of a body is as follows:

1. If $MD = 90$ (case 3, when the body lies on the hour circle through the East and West points), then

$$ZD = 90 - \text{Arctan}\,(\sin |\emptyset| \tan D)$$

where D is the declination of the body. If the body lies in the 1st or 2nd Quadrants, then the ZD so obtained is measured from the nadir. If the body lies in the 3rd or 4th Quadrants, then the ZD so obtained is measured from the zenith.

```
2.  If $MD < 90$ then
    Let $A = \text{Arctan}\,(\cos \emptyset \tan MD)$
    Let $B = \text{Arctan}\,(\tan |\emptyset| \cos MD)$

    If $D$ and $\emptyset$ are of the same sign then
        If MD is UMD then $C = B - |D|$
        If MD is LMD then $C = B + |D|$
    If $D$ and $\emptyset$ are of opposite signs then
        If MD is UMD then $C = B + |D|$
        If MD is LMD then $C = B - |D|$
```

(if $B = |D|$ then the body lies exactly on the prime vertical, case 5, in which case C and $F = 0$).

3. Let $F = \text{Arctan}\,(\sin |\emptyset| \sin MD \tan C)$
and $ZD = A + F$

Observe that C and F can be negative. This occurs in case 4, when the body lies between the prime vertical and the hour circle through the East and West points.

4. If MD is UMD then the ZD so obtained is measured from the zenith.

If MD is LMD then the ZD so obtained is measured from the nadir.

Example: ZD_{SU}: $MD = 37.64$; $D = -18.38$; $A = 25.65$; $B = 44.87$; $C = 26.49$; $F = 13.39$; $ZD = 39.04$ measured from the nadir.

ZD_{MO}: $MD = 16.10$; $D = 11.23$; $A = 10.19$; $B = 50.38$; $C = 39.15$; $F = 10.02$; $ZD = 20.21$ measured from the zenith.

POLE, Q, AND W ALGORITHM

Referring to Figure IV-3, the copole of body S (the angle between its house circle and the equator) can be computed from the triangle whose sides are arcs of the meridian, the equator, and the house circle through S. The angle between the meridian and the house circle is equal to the ZD of S. The side which is an arc of the meridian (from the horizon to the equator) is equal to co Ø. The opposite angle (between the house circle and the equator) is the copole. Then by Rule 4,

$$\cos \text{copole} = \cos \text{co } \emptyset \sin ZD \quad \text{or}$$

Formula IV-2: $\text{pole} = \text{Arcsin}(\sin \emptyset \sin ZD)$

Observe that pole takes the same algebraic sign as Ø.

The body's ascensional difference under its own pole (Q) can now be computed from Formula IV-1, $Q = \text{Arcsin}(\tan D \tan \text{pole})$. Then the body's oblique ascension (or descension) under its own pole (W) is computed as follows;

Formula IV-3: If the body lies in Quadrants 1 or 4, then
OA under own pole is given by: $W = RA - Q$
If the body lies in Quadrants 2 or 3, then
OD under own pole is given by: $W = RA + Q$

CAMPANUS-REGIOMONTANUS MUNDANE CONJUNCTIONS

Once the values of the pole and W for all the horoscope bodies have been calculated, promissors can be directed to mundane conjunction with significators as follows: Figure IV-5 shows the significator S and promissor P in the 2nd Quadrant. The promissor moves by the rotation of the celestial sphere along its diurnal circle from its natal position until it reaches P', the intersection with the house circle through significator S, at which point it is considered to be in conjunction with S. The right ascension of P' is termed the oblique descension (or ascension

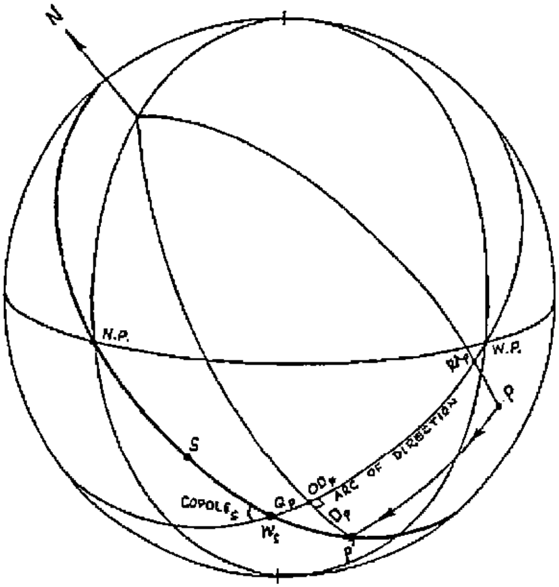

Figure IV - 5

if significator is east of the meridian) of the promissor under the pole of the significator (OD_P). The difference between OD_P and the natal RA of P gives the arc of direction of P CONJ S C-R mund.

Let W_S be significator's W as found in the Campanus-Regiomontanus speculum. Q_P is the promissor's ascensional difference under the pole of the significator, i.e., the arc along the equator from W_S to OD_P. By Rule 9,

$$\sin Q_P = \tan D_P \cot \text{copole}_S \qquad \text{or}$$

Formula IV - 4: $Q_P = \text{Arcsin}\ (\tan D_P \tan \text{pole}_S)$

where D_P is the promissor's declination and pole_S is the significator's pole.

In the example in Figure IV-5,

$OD_P = W_S - Q_P$ ($Q_P < 0$ since $D_P < 0$)

and $W_S = RA_S + Q_S$

hence $OD_P = RA_S + Q_S - Q_P$.

The arc of direction $= RA_P - OD_P$

$= (RA_P + Q_P) - (RA_S + Q_S)$

$= W_P - W_S$

where W_P, promissor's analogy of W, is defined to equal $RA_P + Q_P$.

CAMPANUS - REGIOMONTANUS MUNDANE CONJUNCTION ALGORITHM

The general algorithm for computing the arc of direction of promissor P conjunct significator S in the Campanus and Regiomontanus systems is:

Formula IV-5: If the significator lies in Quadrants 1 or 4, then promissor's analogy of W is given by: $W_P = RA_P - Q_P$

If the significator lies in Quadrants 2 or 3, then promissor's analogy of W is given by: $W_P = RA_P + Q_P$

where RA_P is the natal RA of the promissor and Q_P is the promissor's ascensional difference under the pole of the significator, from Formula IV-4, $Q_P = \text{Arcsin}\ (\tan D_P \tan \text{pole}_S)$. Observe that the formula for W_P depends wholly upon whether the significator is east or west of the meridian, irrespective of the location of the promissor.

Formula IV-6: The arc of direction of promissor P conjunct significator S (P CONJ S C-R mund) is given by: Arc = $W_P - W_S$.

Arc is positive in a direct direction and negative in a converse direction.

Example: SU CONJ ME C-R mund d: $D_{SU} = -18.38$; $\text{pole}_{ME} = 21.27$; by Formula IV-4, $Q_{SU} = -7.43$; $RA_{SU} = 230.01$; by Formula IV-5, $W_{SU} = 222.58$; $W_{ME} = 210.41$; by Formula IV-6, Arc = 12.17.

SA CONJ VE C-R mund c: $D_{SA} = 10.92$; $\text{pole}_{VE} = 3.88$; by Formula IV-4, $Q_{SA} = 0.75$; $RA_{SA} = 157.63$; by Formula IV-5, $W_{SA} = 158.38$; $W_{VE} = 195.47$; by Formula IV-6, Arc = -37.09.

Observe that if the MC is significator, $\text{pole}_S = 0$, hence $Q_P = 0$, hence $W_P = RA_P$; also W_S in this case = RAMC, so Formula IV-6 becomes Arc = RA_P - RAMC.

Similarly, if the Ascendant is significator, $\text{pole}_S = Ø$, hence $Q_P = AD_P$ and $W_P = OA_P$; also $W_S = OA_{ASC}$, so Formula IV-6 becomes Arc = $OA_P - OA_{ASC}$.

CAMPANUS - REGIOMONTANUS ZODIACAL DIRECTIONS

The foregoing has been a description of the mundane conjunction in the Campanus and Regiomontanus systems. Since a zodiacal direction may be regarded as a type of mundane conjunction, wherein a point on the ecliptic (at the longitude of a zodiacal aspect point to the promissor) is brought to mundane conjunction with the significator, zodiacal directions are calculated the same way in both the Campanus and Regiomontanus systems.

The longitude of the aspect point to the promissor is equal to the longitude of the promissor plus the value of the aspect (± 60, 90, 120, etc.). From the longitude of the aspect point, calculate the RA and declination of the aspect point from Formulas A2 and A4. Thence proceed as for a mundane conjunction, taking the aspect point for the promissor.

Example: MO TRI SA C-R zod c: the trine to the moon is at 0 VI 26; from Formula A2, the RA of this point = 152.50; from Formula A4, the declination of this point = 11.32; pole_{SA} = 41.40, so by Formula IV-4, Q_{AP} = 10.16; by Formula IV-5, W_{AP} = 142.34; W_{SA} = 147.84; so by Formula IV-6, Arc = -5.50.

CAMPANUS - REGIOMONTANUS FIELD PLANE DIRECTIONS

To compute a field plane direction, use the longitude of the aspect point to the promissor together with the celestial latitude of the field plane body in Formulas A5 and A6 to obtain the declination and RA of the aspect point. Thence proceed as for a mundane conjunction, taking the aspect point for the promissor.

Example: MO TRI SA C-R c in the field plane of the moon when next it trines the natal longitude of Saturn: the longitude of the aspect point is 0 VI 26, and the moon next arrives there on 23 November 1948 at 19:32 GMT, at which time its celestial latitude is 4 N 41; going into Formula A5 with L = 150.44 and B = 4.68 gives a declination = 15.70, and from Formula A6, RA = 154.22; pole_{SA} = 41.40, so by Formula IV-4, Q_{AP} = 14.35; by Formula IV-5, W_{AP} = 139.87; W_{SA} = 147.84, so by Formula IV-6, Arc = -7.97.

CAMPANUS - REGIOMONTANUS MUNDANE PARALLELS

In the Campanus and Regiomontanus systems, two points (PP and S in Figure IV-6, which shows the celestial sphere projected onto the prime vertical) are said to be in mundane parallel (||) if they lie on opposite sides of the meridian and if their respective house circles intersect the prime vertical at like distances from the meridian, i.e., if their ZD's are equal (and

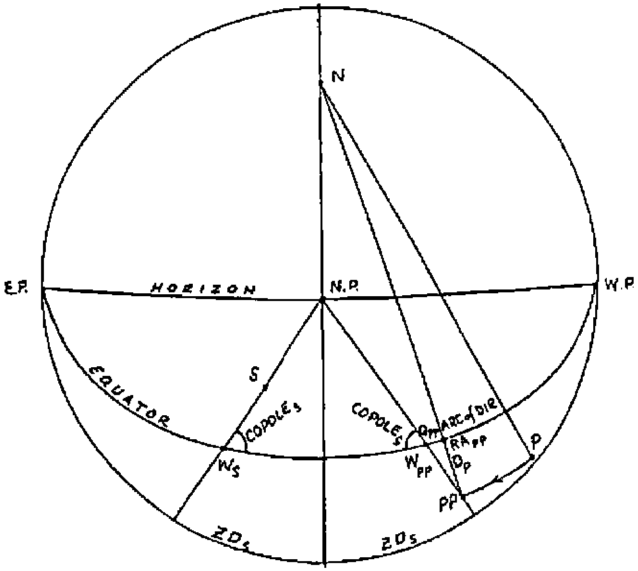

Figure IV-6

measured from the same horizon pole - zenith or nadir). A mundane contraparallel (╫) occurs when the two points are on the same side of the meridian and have equal ZD's measured from opposite horizon poles. Thus the mundane parallel may be considered the reflection of the mundane conjunction across the meridian, and the mundane contraparallel may be considered the reflection of the mundane opposition across the meridian.

To compute the mundane parallel P || S C-R mund, observe that W_{PP} (the W of the mundane parallel point to the significator) is given by:

$W_{PP} = 2 \times RA - W_S$

where RA is the RA of the nearest meridian (RAMC or RAIC) to the significator and W_S is the significator's W. Observe too that since their ZD's are the same, the poles of S and PP are the same, so Q_{PP} of the parallel point is computed in the usual way from Formula IV-4, Q_{PP} = Arcsin (tan D_P tan $pole_S$), where D_P is the declination of the promissor and $pole_S$ is the pole of the significator. However, here Q_{PP} falls away from W_{PP} in the opposite direction than it would if the direction was to a conjunction (since the parallel point lies on the opposite side of the meridian from the significator, so the rules in Formula IV-5 must be reversed).

The general algorithm for directing a promissor P to mundane parallel with significator S in the Campanus and Regiomontanus systems is:

1. Compute W_{PP} of the parallel point: $W_{PP} = 2 \times RA - W_S$ where RA = RAIC if significator's MD is LMD and RA = RAMC if significator's MD is UMD, and W_S is significator's W (from the Campanus-Regiomontanus speculum).

2. Compute Q_{PP} of the parallel point from Formula IV-4, using D_P of promissor and $pole_S$ of significator.

3. If the significator lies in Quadrants 1 or 4, then

$$RA_{PP} = W_{PP} - Q_{PP}$$

If the significator lies in Quadrants 2 or 3, then

$$RA_{PP} = W_{PP} + Q_{PP}$$

4. Arc of direction P || S C-R mund is given by:

$$Arc = RA_P - RA_{PP}$$

where RA_P is the RA of the promissor.

To direct a promissor P to mundane contraparallel with significator S in the Campanus-Regiomontanus systems, substitute 2 x RA - W_S + 180 for W_{PP} in Step 1 and reverse the rules in Step 3.

Example: SA || ME C-R mund c: RAIC = 192.37; W_{ME} = 210.41; hence W_{PP} = 174.33; D_{SA} = 10.92 and $pole_{ME}$ = 21.27, hence from Formula IV-4, Q_{PP} = 4.31; RA_{PP} = 178.64; RA_{SA} = 157.63, hence Arc = -21.01.

MUNDANE ASPECTUAL DIRECTIONS

In a mundane aspectual direction, the promissor is conceived of as moving along its diurnal circle until it intersects the house circle of a mundane aspect of the significator, at which point it is considered to be in the given aspect to the signficator.

Mundane aspects (other than the conjunction and opposition) differ in the Campanus and Regiomontanus systems, since the measure of numerical Mundane Position is different in the two systems (ZD measures Campanus MP and W measures Regiomontanus MP).

REGIOMONTANUS MUNDANE ASPECTUAL DIRECTIONS

To compute a Regiomontanus mundane aspectual direction, let $W_{AP} = W_S + A$, where W_{AP} is the W of the aspect point (on the equator) and A is the value of the given aspect ($\pm$ 60, 90 120, etc.). The pole of this point must be found to compute Q_P. Referring to Figure IV-7, the copole can be computed from the triangle whose sides

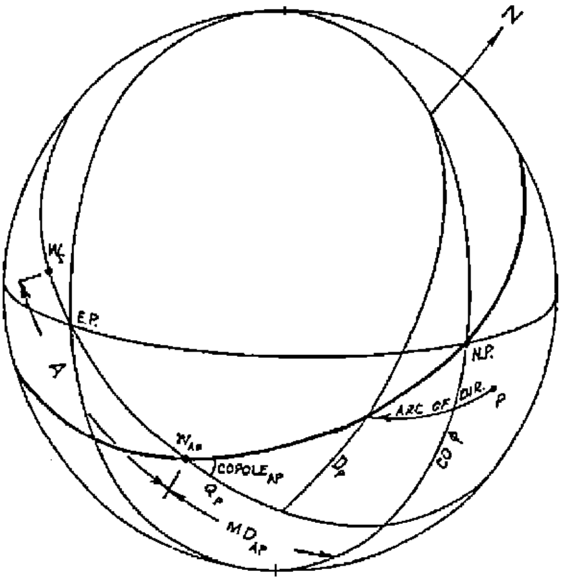

Figure IV-7

are arcs of the house circle through W_{AP}, the equator (= MD of W_{AP}), and the meridian (= co Ø). By Rule 10,

$$\sin MD_{AP} = \tan \text{co } Ø \cot \text{copole}_{AP} \quad \text{or}$$

$$\text{pole}_{AP} = \text{Arctan} (\tan Ø \sin MD_{AP})$$

From Formula IV-4, $Q_P = \text{Arcsin} (\tan D_P \tan \text{pole}_{AP})$ where D_P is the declination of the promissor. Thence W_P is computed from Formula IV-5 using RA_P of promissor, and the arc of direction is computed from Formula IV-6 using W_P of the promissor and W_{AP} of the aspect point.

To recapitulate: the general algorithm for directing a promissor P to mundane aspect A of significator S in the Regiomontanus system is:

1. Let $W_{AP} = W_S + A$, where W_S is significator's W (from the Campanus-Regiomontanus speculum) and A is the value of the aspect.

2. Let $MD_{AP} = |W_{AP} - RA|$, where RA is the RA of the meridian nearest to the aspect point (RAMC or RAIC).

3. Compute Q_P from Formula IV-4 using D_P of the promissor, but replacing pole_S with Arctan (tan Ø sin MD_{AP}).

4. Use this value of Q_P with RA_P of the promissor in Formula IV-5 to obtain W_P (subtracting if W_{AP} is east of the meridian and adding if W_{AP} is west of the meridian).

5. The arc of direction of P A S Regio mund is given by:

$$\text{Arc} = W_P - W_{AP}$$

Example: MO TRI SA Regio mund c: $W_{SA} = 147.84$; $A = -120$; hence $W_{AP} = 27.84$; RAMC = 12.37; hence $MD_{AP} = 15.47$ and $\text{pole}_{AP} = 18.54$; $D_{MO} = 11.23$; hence by Formula IV-4, $Q_{MO} = 3.82$; $RA_{MO} = 28.47$ and W_{AP} is east of the meridian, hence by Formula IV-5 $W_{MO} = 24.65$; Arc = -3.19.

CAMPANUS MUNDANE ASPECTUAL DIRECTIONS

To compute Campanus mundane aspectual directions, it is convenient to express Campanus Mundane Position (CMP) of the significator on a scale of 0 to 360 degrees measured along the prime vertical from the East point towards the nadir.

Let CMP be the Campanus Mundane Position of the significator and let ZD be its zenith distance. Then:

If the significator lies in Quadrants 1 or 4, then
    If ZD was measured from the zenith then CMP = 270 + ZD
    If ZD was measured from the nadir then CMP = 90 - ZD
If the significator lies in Quadrants 2 or 3, then
    If ZD was measured from the zenith then CMP = 270 - ZD
    If ZD was measured from the nadir then CMP = 90 + ZD

To direct promissor P to mundane aspect A of significator S in the Campanus system (Figure IV-8), the CMP_{AP} of the aspect point to significator (which lies on the prime vertical) equals $CMP_S + A$, where CMP_S is the Campanus Mundane Position of the significator and A is the value of the aspect. The ZD_{AP} of the aspect point therefore equals $90 - CMP_{AP}$. The $pole_{AP}$ of the aspect point is found from Formula IV-2. The declination and RA of the aspect point are calculated from the triangle whose sides are arcs of the prime vertical (= CMP_{AP}), the hour circle through the aspect point (= D_{AP}), and the equator (= $RA_{AP} - RA_{EP}$). The angle between the prime vertical and the equator = Ø, hence by Rule 1,

sin $(-D_{AP})$ = sin Ø sin CMP_{AP} (since $D_{AP} < 0$) or D_{AP} = -Arcsin (sin Ø sin CMP_{AP}).

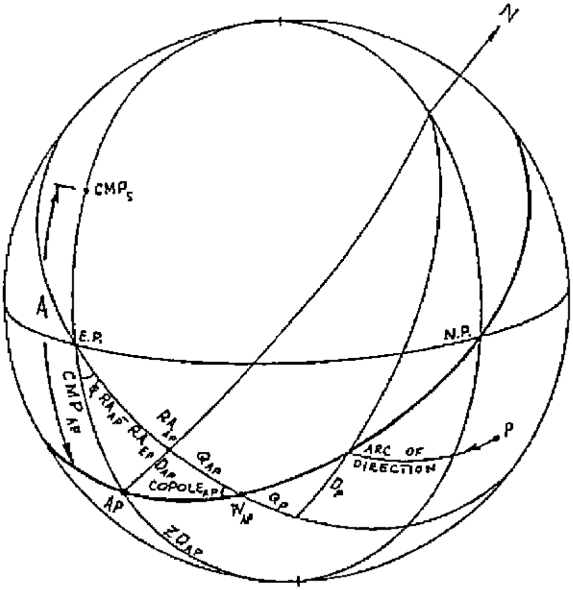

Figure IV-8

By Rule 8,

cos Ø = tan $(RA_{AP} - RA_{EP})$ cot CMP_{AP}, or

RA_{AP} = RAMC + 90 + Arctan (cos Ø tan CMP_{AP})

Now Q_{AP} can be obtained from Formula IV-1 using D_{AP} and $pole_{AP}$, and W_{AP} can be obtained from Formula IV-3 using Q_{AP} and RA_{AP}. Thence proceed as for a mundane conjunction, treating the aspect point AP as significator.

To recapitulate: the general algorithm for directing a promissor P to mundane aspect A of significator S in the Campanus system is:

1. Let $CMP_{AP} = CMP_S + A$, where CMP_S is the Campanus Mundane Position of the significator (from the Campanus-Regiomontanus speculum) and A is the value of the aspect.

2. Let $ZD_{AP} = |CMP_{AP} - 90|$, then use this value of ZD in Formula IV-2 to obtain $pole_{AP}$; however, let $pole_{AP}$ take the same algebraic sign as Ø.

3. Let D_{AP} = - Arcsin (sin Ø sin CMP_{AP}), then use this value of declination together with $pole_{AP}$ in Formula IV-1 to obtain Q_{AP}.

4. Let X = Arctan (cos Ø tan CMP_{AP})

5. If $0 \leq CMP_{AP} < 90$ or $270 < CMP_{AP} \leq 360$*,
then let $RA_{AP} = RAMC + 90 + X$ and let $W_{AP} = RA_{AP} - Q_{AP}$
If $90 < CMP_{AP} < 270$,
then let $RA_{AP} = RAMC - 90 + X$ and let $W_{AP} = RA_{AP} + Q_{AP}$

6. Compute Q_P from Formula IV-4 using the declination of the promissor and $pole_{AP}$ of the aspect point.
If $0 \leq CMP_{AP} < 90$ or $270 < CMP_{AP} \leq 360$,
then let $W_P = RA_P - Q_P$
If $90 < CMP_{AP} < 270$,
then let $W_P = RA_P + Q_P$
where RA_P is the RA of the promissor.

7. Arc of direction P A S Camp mund is given by:
$Arc = W_P - W_{AP}$.

Example: MO TRI SA Camp mund d: $CMP_{SA} = 32.32$ and $A = -120$, hence $CMP_{AP} = 272.32$; $ZD_{AP} = 182.32$; from Formula IV-2, $pole_{AP} = 1.82$ (take the absolute value of the pole since Ø > 0); $D_{AP} = 51.44$; from Formula IV-1, $Q_{AP} = 2.28$; $X = -86.28$; $RA_{AP} = 16.09$ and $W_{AP} = 13.81$; $D_{MO} = 11.23$, hence from Formula IV-4 $Q_{MO} = 0.36$; $RA_{MO} = 28.47$ hence $W_{MO} = 28.11$, and $Arc = 14.30$.

RAPT PARALLELS

There are innumerable permutations and combinations of possible primary direction calculations involving mundane and zodiacal midpoints, of which only one will be mentioned here. When the mundane midpoint of two bodies X and Y occupies the natal Mundane Position of a third body Z, then X and Y are said to be in rapt parallel with respect to Z, written $X / Y = Z$.

In the Campanus and Regiomontanus systems the calculation of the arc of direction through which the promissors X and Y must move along their respective diurnal circles to reach positions mundanely equidistant from the natal Mundane Position of significator Z is rather complex because of the transformation of coordinates involved. It is not simply a matter of directing $(MP_X + MP_Y) / 2$ along its own diurnal circle to MP_Z; rather, the equatorial motion of X and Y must be projected onto the prime vertical and then back onto the equator. The method will merely be outlined here.

1. Compute MP_Z, the numerical Mundane Position of the significator (CMP_Z if Campanus or W_Z if Regiomontanus).

2. Let the starting value of the arc of direction be:
$Arc = (RA_X + RA_Y) / 2 - RA_Z$

---

*If $CMP_{AP} = 90$ or 270 then the direction is to the IC or MC.

3. Let $RA_{X'} = RA_X - Arc$ and let $D_{X'} = D_X$
Let $RA_{Y'} = RA_Y - Arc$ and let $D_{Y'} = D_Y$
then use these values of RA and declination to compute the numerical Mundane Positions $MP_{X'}$ and $MP_{Y'}$ for the given house system.

4. As X moves along its diurnal circle to X' (Figure IV-9), RA_X moves to $RA_{X'}$ and MP_X moves to $MP_{X'}$. Now the mundane midpoint of X' and Y' differs from the Mundane Position of Z by an arc of length $dMP = (MP_{X'} + MP_{Y'}) / 2 - MP_Z$, and the increment in arc in RA which corresponds to this increment in MP can be approximated by: $dArc = dMP \times (RA_X - RA_{X'}) / (MP_X - MP_{X'})$. Therefore, substitute Arc + dArc for Arc in Step 3 above and recycle until succeeding iterations are sufficiently constant.

This method can be used for computing rapt parallels in any house system by using for MP the numerical Mundane Position of that house system.

Example: SU / JU = ME Camp d: Arc = 28.72
SU / JU = ME Regio d: Arc = 30.37
MO / UR = SU Camp d: Arc = 3.37
MO / UR = SU Regio d: Arc = 7.38

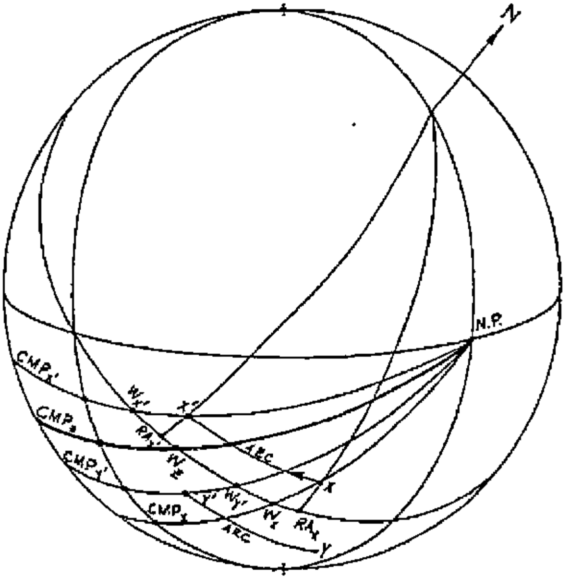

Figure IV-9

CAMPANUS - REGIOMONTANUS SPECULUM

	LONG	RA	DEC	MD	ZD
SUN	232.42	230.01	-18.38	37.64	39.04
MOON	30.44	28.47	11.23	16.10	20.21
MERCURY	216.96	215.22	-12.17	22.85	27.61
VENUS	196.38	195.79	- 4.77	3.42	4.96
MARS	260.95	260.08	-24.07	67.71	57.67
JUPITER	269.89	269.87	-23.38	77.50	64.15
SATURN	155.27	157.63	10.92	34.74	57.68
URANUS	89.93	89.93	23.65	77.56	63.97
NEPTUNE	194.13	193.60	- 4.17	1.23	1.81
PLUTO	136.56	141.49	23.07	50.88	85.62
CHIRON	238.23	236.71	-16.70	44.34	45.79
COMET	197.96	187.69	-26.52	4.68	4.61
NODE	34.96	32.68	13.18	20.31	24.35
ASC	125.50	127.86	18.90	64.51	90.
MC	13.44	12.37	5.30	0.	0.

FOR PRINCE CHARLES

	POLE	Q	W	CMP
SUN	29.54	-10.85	219.16	129.04
MOON	15.68	3.20	25.27	290.21
MERCURY	21.27	- 4.81	210.41	117.61
VENUS	3.88	- 0.32	195.47	94.96
MARS	41.40	-23.19	236.89	147.67
JUPITER	44.77	-25.40	244.47	154.15
SATURN	41.40	9.79	147.84	32.32
URANUS	44.69	25.67	64.26	333.97
NEPTUNE	1.42	- 0.10	193.50	91.81
PLUTO	51.29	32.10	109.39	4.38
CHIRON	34.12	-11.73	224.98	135.79
COMET	3.61	- 1.80	189.49	85.39
NODE	18.82	4.58	28.10	294.35
ASC	51.50	25.49	102.37	0.
MC	0.	0.	12.37	270.

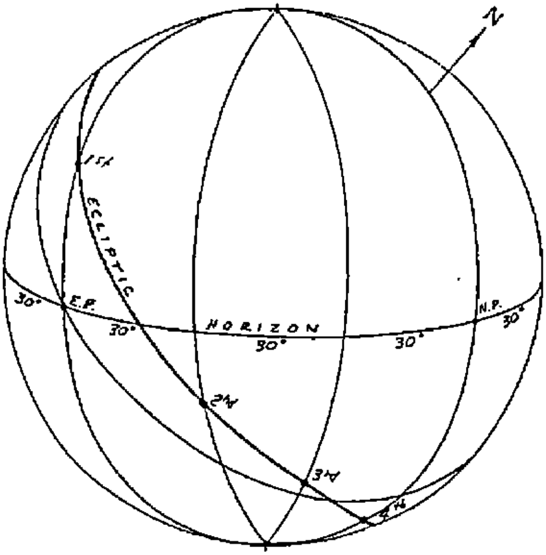

Figure V-1

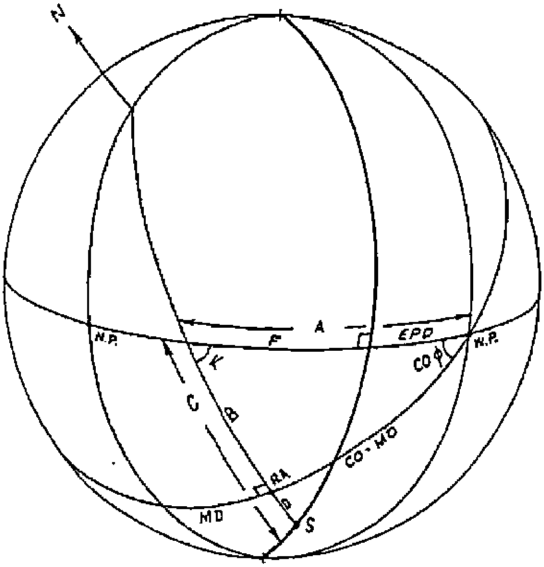

Figure V-2

CHAPTER V: THE HORIZONTAL SYSTEM

In the Horizontal house system, the horizon is divided into twelve 30 degree arcs (beginning at the East point) by six vertical circles (great circles through the zenith and nadir). Where these vertical circles intersect the ecliptic measure the longitudes of the Horizontal house cusps (Figure V-1). Observe that the 10th and 4th Horizontal house cusps are the MC and IC as usual, but the 1st Horizontal house cusp is the Antivertex (instead of the Ascendant) and the 7th Horizontal house cusp is the Vertex (instead of the Descendant).

HORIZONTAL MUNDANE POSITION

In the Horizontal system two points are considered to be conjunct (have the same Mundane Position) if they lie on the same vertical circle. Mundane Position in the Horizontal system will be called East point distance (EPD), i.e., the EPD of a point is the arc measured along the horizon from the East (or West) point to the intersection with the vertical circle passing through the point (Figure V-2). When Horizontal Mundane Position is expressed on a scale of 0 to 360 degrees (measured along the horizon in an easterly direction from the North point to the intersection with the vertical circle through the point), then it is termed tho azimuth (AZ) of the point.

EAST POINT DISTANCE

Referring to Figure IV-4, there are ten possible locations for a body in any given quadrant. Consider a 2nd Quadrant case 6, where body S lies between the equator and the prime vertical (Figure V-2).

To compute the EPD of body S, consider the triangle whose sides are arcs of the horizon (= A in the figure), the hour circle through S (= B), and the equator (= co MD). Call the angle between the horizon and hour circle K. The angle between the horizon and equator equals co Ø. Then by Rule 7,

$\cos \text{co}\,\phi = \tan \text{co MD} \cot A$ or

$A = \text{Arctan}\,(\cot \text{MD} / \sin \phi)$

By Rule 9, $\sin \text{co MD} = \tan B \cot \text{co}\,\phi$ or

$B = \text{Arctan}\,(\cos \text{MD} \cot \phi)$

By Rule 4, $\cos K = \cos \text{co MD} \sin \text{co}\,\phi$ or

$\cos K = \sin \text{MD} \cos \phi$

Consider the triangle whose sides are arcs of the hour circle through S (= C), the horizon (= F), and the vertical circle through S. The angle between the horizon and hour circle equals K, and C is numerically equal to B - D (since $D < 0$ here) where D is the declination of S. Then by Rule 8,

$$\cos K = \tan F \cot C$$ and substituting for cos K,

$$\sin MD \cos Ø = \tan F \cot C$$ or

$$F = \text{Arctan}\,(\sin MD \cos Ø \tan C)$$

Then the East point distance of body S is given by:

$$EPD = A - F$$

and its azimuth equals 270 + EPD (since the azimuth of the West point = 270).

EPD AND AZIMUTH ALGORITHM

The general algorithm for computing the EPD and azimuth of a body is as follows:

```
1.    If $MD = 0$ then $EPD = 90$ and
          If $Ø > 0$ then
              If MD is UMD then $AZ = 180$
              If MD is LMD then $AZ = 0$
          If $Ø < 0$ then
              If MD is UMD then $AZ = 0$
              If MD is LMD then $AZ = 180$

2.    If $MD = 90$ then $EPD = \text{Arctan}(\cos Ø \tan D)$, where D is the
declination of the body.
       Ifthe body lies in Quadrants 1 or 4, then $AZ = 90 - EPD$
       If the body lies in Quadrants 2 or 3,  then $AZ = 270 + EPD$
Observe that this formula allows the EPD to be negative.

3.    If $0 < MD < 90$ then let
          $A = \text{Arctan}(\cot MD / \sin |Ø|)$
          $B = \text{Arctan}(\cos MD \cot |Ø|)$
      If $Ø > 0$ then
          If MD is UMD then let $C = B + D$
          If MD is LMD then let $C = B - D$
      If $Ø < 0$ then
          If MD is UMD then let $C = B - D$
          If MD is LMD then let $C = B + D$
where D is the declination of the body.

4.    Let $F = \text{Arctan}(\sin MD \cos Ø \tan C)$
      and $EPD = |A - F|$

      If $Ø > 0$ then
          If the body lies in Quadrants 1 or 4 then
              If MD is UMD then $AZ = 90 + A - F$
              If MD is LMD then $AZ = 90 - A + F$
          If the body lies in Quadrants 2 or 3 then
              If MD is UMD then $AZ = 270 - A + F$
              If MD is LMD then $AZ = 270 + A - F$
      If $Ø < 0$ then
          If the body lies in Quadrants 1 or 4 then
              If MD is UMD then $AZ = 90 - A + F$
              If MD is LMD then $AZ = 90 + A - F$
          If the body lies in Quadrants 2 or 3 then
              If MD is UMD then $AZ = 270 + A - F$
              If MD is LMD then $AZ = 270 - A + F$
```

Observe that in the above algorithm C and F can be negative.
Example: EPD_{SU}: $D_{SU} = -18.38$; $MD_{SU} = 37.64$;
A = 58.89; B = 32.21; C = 50.59; F = 24.83; EPD = 34.06;
AZ = 304.06
EPD_{MO}: $D_{MO} = 11.23$; $MD_{MO} = 16.10$;
A = 77.27; B = 37.39; C = 48.62; F = 11.09; EPD = 66.18;
AZ = 156.18

POLE, Q, AND W

Once the EPD of a body S has been calculated (Figure V-3), its copole (the angle between the equator and the vertical circle through S) and pole can be computed from the triangle whose sides are arcs of the equator, the vertical circle through S, and the horizon (= EPD). The angle between the equator and horizon equals co Ø. Therefore, by Rule 4,
cos copole =
cos EPD sin co Ø, or

Formula V-1: pole =
±Arcsin (cos EPD cos Ø)

i.e., let pole take the same algebraic sign as Ø. Pole varies in value from 0 (for a body on the meridian) to co Ø (for a body on the prime vertical).

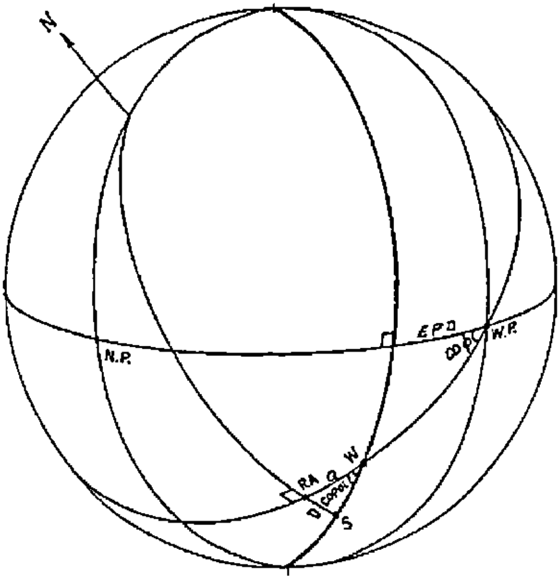

Figure V-3

Define Q, the body's ascensional difference under its own copole, to be the arc along the equator from the intersection with the hour circle through the body to the intersection with the vertical circle through the body. Q can be calculated from the triangle whose sides are arcs of the hour circle through the body (= D, the body's declination), the vertical circle through the body, and the equator (= Q). The angle between the equator and vertical circle is equal to the copole. Therefore, by Rule 10,

sin Q = tan D cot copole or

Formula V-2: Q = Arcsin (tan D tan pole)

Define W, the body's oblique descension (or ascension) under its own copole, to be the point of intersection of the equator and the vertical circle through the body. "W" also is used to mean the RA of this point. Then,

Formula V-3: If the body lies in Quadrants 1 or 4 then $W = RA + Q$
If the body lies in Quadrants 2 or 3 then $W = RA - Q$

where RA is the RA of the body.

HORIZONTAL MUNDANE CONJUNCTIONS

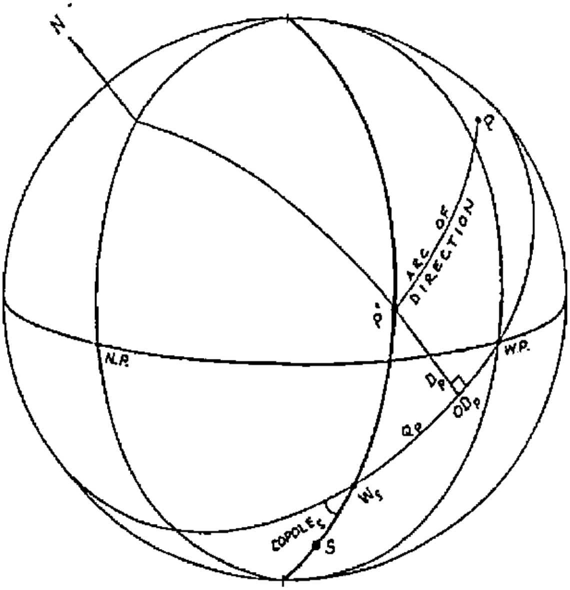

Figure V-4

Promissors can be directed to mundane conjunction with significators in the Horizontal system as follows: Figure V-4 shows the significator S in the 2nd Quadrant and the promissor P in the 3rd Quadrant. The promissor moves by the rotation of the celestial sphere along its diurnal circle from its natal position until it reaches P', the intersection with the vertical circle through significator S, at which point it is considered to be conjunct S. The RA of this point P' is termed OD_P, the oblique descension (or ascension) of the promissor under the copole of the significator. OD_P is distant from W_S (significator's W) by an arc whose measure is Q_P, the ascensional difference of the promissor under the copole of the significator. Q_P can be computed from the triangle whose sides are arcs of the equator (= Q_P), the hour circle through P' and OD_P (= D_P, the declination of the promissor), and the vertical circle through the significator. The angle between the equator and the vertical circle equals copole_S. Then by Rule 10,

$$\sin Q_P = \tan D_P \cot \text{copole}_S \quad \text{or}$$

Formula V-4: $Q_P = \text{Arcsin} (\tan D_P \tan \text{pole}_S)$

where D_P is the promissor's declination and pole_S is the significator's pole.

In Figure V-4, $OD_P = W_S + Q_P$, and the arc of direction equals $RA_P - OD_P$, therefore

$$\begin{aligned} \text{Arc} &= RA_P - (W_S + Q_P) \\ &= (RA_P - Q_P) - W_S \\ &= W_P - W_S \end{aligned}$$

where W_P, promissor's analogy of W, is defined to equal $RA_P - Q_P$.

HORIZONTAL MUNDANE CONJUNCTION ALGORITHM

The general algorithm for computing the arc of direction of promissor P conjunct significator S in the Horizontal system is:

Formula V-5:
If the significator lies in Quadrants 1 or 4 then $W_P = RA_P + Q_P$
If the significator lies in Quadrants 2 or 3 then $W_P = RA_P - Q_P$

where RA_P is the natal RA of the promissor and Q_P is the promissor's ascensional difference under the copole of the significator (from Formula V-4).

Formula V-6: The arc of direction of promissor P conjunct significator S (P CONJ S Horiz mund) is given by: Arc = $W_P - W_S$.

where W_S is significator's W (from the Horizontal Speculum). Arc is positive if the direction is direct and negative if it is converse.
Example: SU CONJME Horiz mund d: $D_{SU} = -18.38$; $pole_{ME} = 20.09$; by Formula V-4, $Q_{SU} = -6.98$; $RA_{SU} = 230.01$; by Formula V-5, $W_{SU} = 236.99$; $W_{ME} = 219.74$; by Formula V-6, Arc = 17.25

SA CONJ VE Horiz mund c: $D_{SA} = 10.92$; $pole_{VE} = 2.91$; by Formula V-4, $Q_{SA} = 0.56$; $RA_{SA} = 157.63$; by Formula V-5, $W_{SA} = 157.07$; $W_{VE} = 196.03$; by Formula V-6, Arc = -38.96

Observe that if the MC is significator, then W_S = RAMC and $W_P = RA_P$ (since $pole_S$ and Q_P equal zero), therefore Formula V-6 becomes: Arc = RA_P - RAMC.

Similarly, if the Vertex is significator, then $W_S = OD_{2VTX}$ and $pole_S$ = co Ø, hence Q_P = Arcsin (tan D_P cot Ø) = AD_{2P} and W_P equals OD_{2P}, so Formula V-6 becomes: Arc = $OD_{2P} - OD_{2VTX}$.

HORIZONTAL ZODIACAL DIRECTIONS

Zodiacal directions in the Horizontal system are calculated in the usual way: the longitude of the aspect point to promissor is equal to the longitude of the promissor plus the value of the aspect. From the longitude of the aspect point, calculate the RA and declination of the aspect point from Formulas A2 and A4. Thence proceed as for a mundane conjunction, taking the aspect point for the promissor.
Example: MO TRI SA Horiz zod c: the trine to the moon is at 0 VI 26; from Formula A2, the RA of this point = 152.50; from Formula A4, the declination of this point = 11.32; $pole_{SA} = 21.87$, so by Formula V-4, $Q_{AP} = 4.61$; by Formula V-5, $W_{AP} = 157.11$; $W_{SA} = 162.07$, so by Formula V-6, Arc = -4.96.

HORIZONTAL FIELD PLANE DIRECTIONS

Field plane directions are computed in the same fashion as zodiacal directions, but in place of zero degrees celestial latitude, the celestial latitude of the field plane body is used with the longitude of the aspect point to promissor to obtain the declination and RA of the aspect point from Formulas A5 and A6.

Thence proceed as for a mundane conjunction, taking the aspect point for the promissor.
Example: MO TRI SA Horiz c in the field plane of the moon when next it trines Saturn: the longitude of the aspect point is 0 VI 26, and the moon next arrives here on 23 November 1948 at 19:32 GMT, at which time its celestial latitude is 4 N 41; from Formula A5, this longitude and celestial latitude yield a declination of 15.70, and from Formula A6, RA = 154.22; pole_{SA} = 21.87, so by Formula V-4, Q_{AP} = 6.48; by Formula V-5, W_{AP} = 160.70; W_{SA} = 162.07, so by Formula V-6, Arc = -1.37.

HORIZONTAL MUNDANE PARALLELS

In the Horizontal system, two points (PP and S in Figure V-5, which shows the celestial sphere projected onto the prime vertical) are said to be in mundane parallel if they lie on opposite sides of the meridian and if the vertical circles through them intersect the horizon at like distances from the meridian, i.e., if their EPD's are equal and measured from opposite meridian poles (East or West points). A mundane contraparallel occurs when the two points are on the same side of the meridian (but opposite sides of the horizon) and have equal EPD's measured from the same meridian pole.

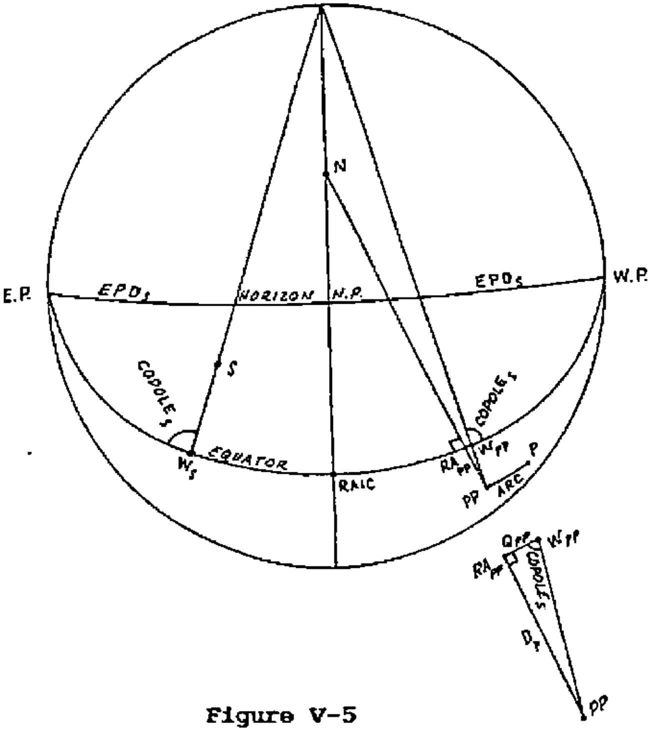

Figure V-5

To compute the mundane parallel P || S Horiz mund, observe that W_{PP} (W of the mundane parallel point to significator) is given by:

$$W_{PP} = 2 \times RA - W_S$$

where RA is the RA of the nearest meridian (RAMC or RAIC) to the significator and W_S is significator's W. Observe too that since their EPD's are the same, the poles of S and PP are the same, so Q_{PP} of the parallel point is computed in the usual way from Formula V-4, $Q_{PP} = \text{Arcsin}(\tan D_P \tan \text{pole}_S)$, where D_P is the declination of the promissor and pole_S is the pole of the significator. However, here Q_{PP} falls away from W_{PP} in the opposite direction than it would if the direction was to a conjunction (since the parallel point lies on the opposite side of the meridian from the significator), so the rules in Formula V-5 must be reversed.

The general algorithm for directing a promissor P to mundane parallel with significator S in the Horizontal system is:

1. Compute W_{PP} of the parallel point: $W_{PP} = 2 \times RA - W_S$ where RA = RAIC if significator's MD is LMD and RA = RAMC if significator's MD is UMD, and W_S is significator's W (from the Horizontal speculum).

2. Compute Q_{PP} of the parallel point from Formula V-4, using D_P of the promissor and $pole_S$ of the significator.

3. If the significator lies in Quadrants 1 or 4, then
$$RA_{PP} = W_{PP} + Q_{PP}$$
If the significator lies in Quadrants 2 or 3, then
$$RA_{PP} = W_{PP} - Q_{PP}$$

4. Arc of direction P || S Horiz mund is given by:
$$Arc = RA_P - RA_{PP}$$
where RA_P is the RA of the promissor.

To direct a promissor P to mundane contraparallel with significator S, substitute $2 \times RA - W_S + 180$ for W_{PP} in Step 1 and reverse the rules in Step 3.
Example: SA || ME Horiz mund c: RAIC = 192.37; $W_{ME} = 219.74$; hence $W_{PP} = 165.00$; $D_{SA} = 10.92$ and $pole_{ME} = 20.09$, hence from Formula IV-4, $Q_{PP} = 4.05$; $RA_{PP} = 160.95$; $RA_{SA} = 157.63$, hence Arc = -3.32.

HORIZONTAL MUNDANE ASPECTUAL DIRECTIONS

Mundane aspectual directions in the Horizontal system can be calculated as follows (Figure V-6): the azimuth of the aspect point to the significator (AP, which lies on the horizon) equals the azimuth of the significator plus A, where A is the value of the aspect (±60, 90, 120, etc.). In Figure V-6 AP is west of the meridian, so the EPD of AP = $|AZ_{AP} - 270|$. Now the $pole_{AP}$ of the aspect point can be found from Formula V-1. The declination D_{AP} and RA_{AP} of the aspect point are calculated from the triangle whose sides are arcs of

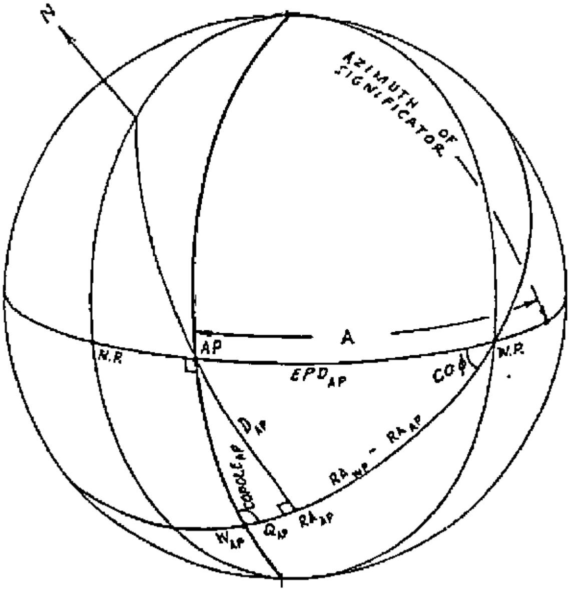

Figure V-6

the horizon (= EPD_{AP}), the hour circle through the aspect point (= D_{AP}), and the equator (= $RA_{WP} - RA_{AP}$). The angle between the horizon and equator equals co ϕ, hence by Rule 1,

$$\sin D_{AP} = \sin \text{co}\,\phi \sin EPD_{AP} \quad \text{or}$$
$$D_{AP} = \text{Arcsin}\,(\cos\phi \sin EPD_{AP})$$

By Rule 8, $\cos \text{co}\,\phi = \tan(RA_{WP} - RA_{AP}) \cot EPD_{AP}$ or

$$RA_{AP} = RAMC - 90 - \text{Arctan}\,(\sin\phi \tan EPD_{AP}).$$

Now Q_{AP} can be obtained from Formula V-2 using D_{AP} and $pole_{AP}$, and W_{AP} can be obtained from Formula V-3 using Q_{AP} and RA_{AP}. Thence proceed as for a mundane conjunction, treating the aspect point AP as significator.

To recapitulate: the general algorithm for directing a promissor P to mundane aspect A of significator S in the Horizontal system is:

1. Let $AZ_{AP} = AZ_S + A$, where AZ_S is the azimuth of the significator and A is the value of the aspect.
    If $0 < AZ_{AP} < 180$ then AP is east of the meridian and
        $EPD_{AP} = |90 - AZ_{AP}|$
    If $180 < AZ_{AP} < 360$ then AP is west of the meridian and
        $EPD_{AP} = |270 - AZ_{AP}|$
(If $AZ_{AP} = 0$ then $W_{AP} = RAIC$ and $pole_{AP} = 0$;
If $AZ_{AP} = 180$ then $W_{AP} = RAMC$ and $pole_{AP} = 0$)

2. Use this value of EPD_{AP} in Formula V-1 to obtain $pole_{AP}$; let $pole_{AP}$ take the same algebraic sign as ϕ.

3. Let $D_{AP} = \pm\text{Arcsin}\,(\cos\phi \sin EPD_{AP})$
i.e., $D_{AP} > 0$ when $0 < AZ_{AP} < 90$ or $270 < AZ_{AP} < 360$
and $D_{AP} < 0$ when $90 < AZ_{AP} < 270$. Use this value of declination together with $pole_{AP}$ in Formula V-2 to obtain Q_{AP}.

4. Let $X = \text{Arctan}\,(\sin\phi \tan EPD_{AP})$

    If $0 < AZ_{AP} \le 90$ then
        $RA_{AP} = RAMC + 90 + X$ and $W_{AP} = RA_{AP} + Q_{AP}$
    If $90 < AZ_{AP} < 180$ then
        $RA_{AP} = RAMC + 90 - X$ and $W_{AP} = RA_{AP} + Q_{AP}$
    If $180 < AZ_{AP} \le 270$ then
        $RA_{AP} = RAMC - 90 + X$ and $W_{AP} = RA_{AP} - Q_{AP}$
    If $270 < AZ_{AP} < 360$ then
        $RA_{AP} = RAMC - 90 - X$ and $W_{AP} = RA_{AP} - Q_{AP}$

5. Compute Q_P of the promissor from Formula V-4 using the declination of the promissor and the $pole_{AP}$ of the aspect point.
    If $0 < AZ_{AP} < 180$ then $W_P = RA_P + Q_P$
    If $180 < AZ_{AP} < 360$ then $W_P = RA_P - Q_P$
where RA_P is the RA of the promissor.

6. Arc of direction P A S Horiz mund is given by:

$$\text{Arc} = W_P - W_{AP}$$

Example: MO TRI SA Horiz mund d: $AZ_{SA} = 36.75$ and $A = +120$*, hence $AZ_{AP} = 156.75$; $EPD_{AP} = 66.75$; from Formula V-1, $pole_{AP} = 14.23$; $D_{AP} = -34.89$; from Formula V-2, $Q_{AP} = -10.19$; $X = 61.23$; $RA_{AP} = 41.14$; $W_{AP} = 30.95$; $D_{MO} = 11.23$, hence from Formula V-4, $Q_{MO} = 2.89$; $RA_{MO} = 28.47$ hence $W_{MO} = 31.36$, and Arc = 0.41.

HORIZONTAL SPECULUM FOR PRINCE CHARLES

	RA	MD	EPD	POLE	Q	W	AZ
SUN	230.01	37.64	34.06	31.05	-11.54	241.55	304.06
MOON	28.47	16.10	66.18	14.56	2.96	31.43	156.18
MERCURY	215.22	22.85	56.51	20.09	- 4.52	219.74	326.51
VENUS	195.79	3.42	85.32	2.91	- 0.24	196.03	355.32
MARS	260.08	67.71	1.16	38.49	-20.81	280.89	271.16
JUPITER	269.87	77.50	5.83	38.26	-19.94	289.81	264.17
SATURN	157.63	34.74	53.25	21.87	4.44	162.07	36.75
URANUS	89.93	77.56	6.08	38.24	20.19	110.12	83.92
NEPTUNE	193.60	1.23	88.33	1.04	- 0.08	193.68	358.33
PLUTO	141.49	50.88	44.37	26.42	12.22	153.71	45.63
CHIRON	236.71	44.34	28.09	33.31	-11.37	248.08	298.09
COMET	187.69	4.68	80.14	6.12	- 3.07	184.62	9.86
NODE	32.68	20.31	59.45	18.45	4.48	37.16	149.45
VTX	262.38	70.01	0.	38.50	-19.98	282.37	270.
MC	12.37	0.	90.	0.	0.	12.37	180.

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*Observe that conventionally azimuth is measured in the opposite direction from the order of the houses.

CHAPTER VI: OTHER PROJECTION SYSTEMS:

MERIDIAN, MORINUS, EQUAL HOUSE, PORPHYRY, ALCABITIUS, AND KOCH

THE MERIDIAN SYSTEM

In the Meridian (or Zariel) house system, the equator is divided into twelve 30 degree arcs (starting at the RAMC) by six hour circles (Figure VI-1). Where these hour circles intersect the ecliptic measure the longitudes of the Meridian house cusps. In the Meridian system the 10th and 4th house cusps are the MC and IC as usual, but the 1st cusp is the right longitude of the East point (instead of the Ascendant) and the 7th cusp is the right longitude of the West point (instead of the Descendant), where the right longitude (RL) of a point is defined to be the longitude of the intersection of the ecliptic with the hour circle through the point.

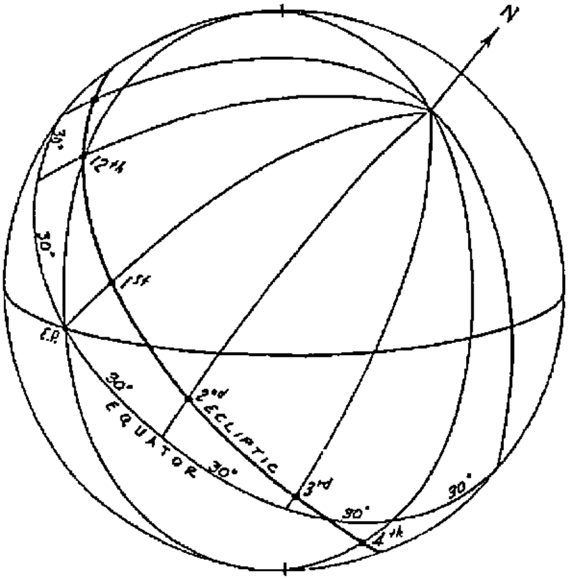

Figure VI-1

MERIDIAN MUNDANE CONJUNCTIONS

In the Meridian system two points are considered to be conjunct if they both lie on the same hour circle (i.e., if they have the same RA). Hence Meridian Mundane Position is right ascension, and the arc of direction of a promissor directed to mundane conjunction with a significator is simply the difference in their RA's. There is really no difference here between promissor and significator, i.e., converse and direct directions have equal arcs but opposite signs.

Example: SU CONJ ME Merid mund d: RA_{SU} = 230.01;
RA_{ME} = 215.22; Arc = 14.79

MERIDIAN MUNDANE ASPECTUAL DIRECTIONS

Mundane aspectual directions are computed by adding the value of the aspect (±60, 90, 120 etc.) to the RA of the significator, and subtracting the sum from the RA of the promissor.
Example: MO TRI SA Merid mund c: $RA_{SA} = 157.63$; Aspect = -120, hence $RA_{AP} = 37.63$; $RA_{MO} = 28.47$, hence Arc = -9.16.

MERIDIAN ZODIACAL AND FIELD PLANE DIRECTIONS

Zodiacal directions are computed by adding the value of the aspect to the longitude of the promissor, converting the sum to RA with Formula A2, and subtracting the RA of the significator from it.
Example: MO TRI SA Merid zod c: $L_{MO} = 30.44$; Aspect = 120, hence $L_{AP} = 150.44$; from Formula A2, the RA of this longitude = 152.50; $RA_{SA} = 157.63$; hence Arc = -5.13.

In a field plane direction, the value of the aspect is added to the promissor's longitude to obtain the longitude of the aspect point, then this longitude is used with the celestial latitude of the field plane body in Formulas A5 and A6 to obtain the RA of the aspect point. The RA of the significator is then subtracted from the RA of the aspect point to obtain the arc of direction.
Example: MO TRI SA Merid c in the field plane of the moon when next it trines Saturn: When the moon next arrives at 0 VI 26 its celestial latitude is 4 N 41, hence from Formula A5 its declination is 15.70 and from Formula A6 its RA is 154.22;
$RA_{SA} = 157.63$, hence Arc = -3.41.

MERIDIAN MUNDANE PARALLELS

To direct a promissor P to mundane parallel of significator S, compute the RA of the mundane parallel point to significator as follows:
If significator lies in the 1st Quadrant, then $RA_{PP} = RAIC + LMD_S$
If significator lies in the 2nd Quadrant, then $RA_{PP} = RAIC - LMD_S$
If significator lies in the 3rd Quadrant, then $RA_{PP} = RAMC + UMD_S$
If significator lies in the 4th Quadrant, then $RA_{PP} = RAMC - UMD_S$
where MD_S is the MD of the significator. Then the arc of direction of P || S Merid mund is given by: Arc = $RA_P - RA_{PP}$
where RA_P is the RA of the promissor.

To direct a promissor P to mundane contraparallel of significator S, proceed as above, letting $RA_{PP} = RA_{PP} + 180$.
Example: SA || ME Merid mund c: $LMD_{ME} = 22.85$, hence $RA_{PP} = 169.52$; $RA_{SA} = 157.63$; hence Arc = -11.89.

THE MORINUS SYSTEM

In the Morinus house system, the equator is divided into twelve 30 degree arcs (beginning at the RAMC) by six longitude circles (great circles through the ecliptic poles*). Where these longitude circles intersect the ecliptic measure the longitudes of the Morinus house cusps (Figure VI-2). Thus the 10th and 4th Morinus house cusps are the longitudes of the RAMC and RAIC, respectively, instead of the MC and IC, and the 1st and 7th cusps are the longitudes of the East and West points, respectively, instead of the Ascendant and Descendant.

Therefore, two points are considered to be conjunct in the Morinus system if they have the same longitude. The equivalent of a body's W in the Morinus system is its zodiacal ascension (ZA), which is that point of the equator (and its RA) where the equator is intersected by the longitude circle through the body. ZA is the Morinus Mundane Position of the body.

MORINUS MUNDANE CONJUNCTIONS

To direct a promissor P to mundane conjunction with significator S in the Morinus system (Figure VI-3), it is only necessary to find the RA of that point P' which lies on the diurnal circle of P and has the same longitude as S. This can be computed from Formula A6 using the longitude of S and the declination of P. The resulting RA is subtracted from the RA of the promissor to obtain the arc of direction.

Example: SU CONJ ME Morin mund d: $D_{SU} = -18.38$; $L_{ME} = 216.96$; hence from Formula A6, RA = 212.96; $RA_{SU} = 230.01$; hence Arc = 17.05.

MORINUS ZODIACAL AND FIELD PLANE DIRECTIONS

To compute a zodiacal direction in the Morinus system, add the value of the aspect to the longitude of the promissor, then find the RA of the aspect point from Formula A2 and the declination of the aspect point from Formula A4. Use this declination of the aspect point together with the longitude of the significator in Formula A6, and subtract the resulting RA from the RA of the aspect point to obtain the arc of direction.

Example: MO TRI SA Morin zod c: $L_{MO} = 30.44$ and Aspect = 120, hence $L_{AP} = 150.44$; from Formula A2, $RA_{AP} = 152.50$, and from Formula A4, $D_{AP} = 11.32$; $L_{SA} = 155.27$, hence from Formula A6, RA = 157.79; hence Arc = -5.29.

In a field plane direction, the value of the aspect is added to the promissor's longitude to obtain the longitude of the aspect point; then this longitude is used together with the celestial latitude of the field plane body in Formula A5 to obtain the declination and in Formula A6 to obtain the RA of the

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*The ecliptic poles are located at RA = 270, D = co E (North) and RA = 90, D = -co E (South).

aspect point. The declination of the aspect point is used together with the longitude of the significator in Formula A6, and the resulting RA is subtracted from the RA of the aspect point to obtain the arc of direction.
Example: MO TRI SA Morin c in the field plane of the moon when next it trines Saturn: When the moon next arrives at 0 VI 26 its celestial latitude is 4 N 41, hence from Formula A5 its declination is 15.70 and from Formula A6 its RA is 154.22; L_{SA} = 155.27; hence from Formula A6, RA = 160.00; and Arc = -5.78.

MORINUS MUNDANE ASPECTUAL DIRECTIONS

To compute a mundane aspectual direction in the Morinus system it is first necessary to compute the zodiacal ascension of the significator. Zodiacal ascension of a body is computed as follows*:

Let $X = \text{Arctan} (\tan L / \cos E)$
If $L = 90$ then $ZA = 90$
If $L = 270$ then $ZA = 270$
If $0 \le L < 90$ then $ZA = X$
If $90 < L < 270$ then $ZA = X + 180$
If $270 < L \le 360$ then $ZA = X + 360$

Once the ZA of the significator has been found, the value of the aspect is added to it to obtain the ZA of the aspect point (which lies on the equator). The longitude of the aspect point is then obtained as follows:

Let $X = \text{Arctan} (\tan ZA_{AP} \cos E)$
If $ZA_{AP} = 90$ then $L_{AP} = 90$
If $ZA_{AP} = 270$ then $L_{AP} = 270$
If $0 \le ZA_{AP} < 90$ then $L_{AP} = X$
If $90 < ZA_{AP} < 270$ then $L_{AP} = X + 180$
If $270 < ZA_{AP} \le 360$ then $L_{AP} = X + 360$

Then this longitude of the aspect point is used together with the declination of the promissor in Formula A6, and the resulting RA is subtracted from the RA of the promissor to obtain the arc of direction.
Example: MO TRI SA Morin mund c: ZA_{SA} = 153.34; Aspect = -120, hence ZA_{AP} = 33.34; X = 31.11, hence L_{AP} = 31.11; D_{MO} = 11.23, hence from Formula A6, RA = 29.21; RA_{MO} = 28.47; Arc = -0.74.

MORINUS MUNDANE PARALLELS

Mundane parallels are rather interesting in the Morinus system since the function which the meridian serves in most other house systems is here served by the great circle passing through the celestial poles, the ecliptic poles, and the Cancer and Capricorn points. That is to say, in a sense the hemisphere from Cancer to Capricorn may be regarded as the "ascending" side of the horoscope and the hemisphere from Capricorn to Cancer may be regarded as the "descending" side (since a body's W is less than its RA with $D > 0$, and its W is greater than its RA with $D < 0$, etc., where W is its zodiacal ascension. This is because the ecliptic poles do not lie on the meridian, whereas the poles of the horizon, prime vertical, and equator do). Thus to direct a promissor P to mundane parallel with significator S, first compute the longitude of the antiscion of S:

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*Formula A2 is not used because it is an hour circle formula and what is needed here is a longitude circle formula.

$$\text{If } 0 \leq L_S < 180 \text{ then } L_{ANTI-S} = 180 - L_S$$
$$\text{If } 180 \leq L_S \leq 360 \text{ then } L_{ANTI-S} = 540 - L_S$$

where L_S is the longitude of the significator. Then this longitude of the antiscion of S is used together with the declination of the promissor in Formula A6, and the resulting RA is subtracted from the RA of the promissor to obtain the arc of direction.

To direct a promissor P to the mundane contraparallel of significator S, add 180 to the longitude of the antiscion of S to obtain the longitude of the contrascion of S. Use this longitude together with the declination of P in Formula A6, and subtract the resulting RA from the RA of the promissor to obtain the arc of direction.

Example: SA ⫲ ME Morin mund d: $L_{ME} = 216.96$, hence $L_{CONTRA-S} = 143.04$; $D_{SA} = 10.92$, hence from Formula A6, RA = 144.35; $RA_{SA} = 157.63$, hence Arc = 13.28

THE EQUAL HOUSE SYSTEM

In the Equal House system the ecliptic is divided into twelve 30 degree arcs (beginning, usually, at the Ascendant). However, if the Equal House system is to be regarded as a projection system, there is no way to define Mundane Position until the projection poles are specified.

If the Equal House system is regarded as a division of the ecliptic by six longitude circles (which is perhaps the obvious way to do it), then two points will be considered to be conjunct if they have the same longitude, as in the Morinus system; and in fact primary directions defined in this manner will be identical to those of Morinus except for mundane aspectual directions. In an Equal House mundane aspectual direction the value of the aspect should be added to the longitude of the significator (instead of the ZA of significator as in Morinus), and then this longitude of the aspect point is used with the declination of the promissor in Formula A6, and the resulting RA is subtracted from the RA of the promissor to obtain the arc of direction.

Example: MO TRI SA Equal mund c: $L_{SA} = 155.27$; Aspect = -120, hence $L_{AP} = 35.27$; $D_{MO} = 11.23$, hence from Formula A6, RA = 33.72; $RA_{MO} = 28.47$, hence Arc = -5.25.

If the Equal House system is regarded as a division of the ecliptic by six hour circles, then two points will be considered to be conjunct if they have the same RA, as in the Meridian system; and primary directions defined in this manner will be identical to those of the Meridian system, except for mundane aspectual directions. In an Equal House mundane aspectual direction the value of the aspect should be added to the right longitude of the significator (instead of its RA, as in the Meridian system). The RL of a body is computed from Formula A3, using the RA of the body. The sum of the significator's RL and the value of the aspect is converted into right ascension with Formula A2 and subtracted from the promissor's RA to obtain the arc of direction.

Example: MO TRI SA Equal mund c: $RL_{SA} = 155.84$; Aspect $= -120$, hence $RL_{AP} = 35.84$; from Formula A2, $RA = 33.53$; $RA_{MO} = 28.47$, hence $Arc = -5.06$.

Just as there is a "Morinus" definition of Equal House primary directions (when projected from the ecliptic poles) and a "Meridian" definition of Equal House primaries (when projected from the celestial poles), so too there is a "Campanus" definition (when projected from the North and South points), a "Horizontal" definition (when projected from the zenith and nadir), and so forth. Thus there is no self-evident way of defining primary directions in the Equal House system.

THE PORPHYRY SYSTEM

In the Porphyry house system the arc along the ecliptic from the MC to the Ascendant is trisected, and these trisection points are the 11th and 12th Porphyry house cusps. The arc along the ecliptic from the Ascendant to the IC is trisected to yield the 2nd and 3rd Porphyry house cusps. As is the case with the Equal House system, the Porphyry system can be regarded as a projection system only after the poles of projection are specified, and it is not self-evident what these poles ought to be. The matter is further complicated by the fact that the circle being divided, the ecliptic, is not being divided into equal arcs. The first problem can be overcome by assuming that the poles of projection are the ecliptic poles, so that mundane conjunctions (and hence zodiacal and field plane directions) in the Porphyry system will coincide with those of Morinus (although one could just as easily define a "Meridian", "Campanus", "Horizontal", etc. version of Porphyry). The second problem, the unequal division of the ecliptic circle, can be overcome by means of a quadrant-wise definition of Mundane Position.

A quadrant-wise definition of Mundane Position results in a redefinition of the standard quadrants. Instead of the lunes delimited by the horizon and meridian, the Porphyry quadrants are the lunes delimited by the longitude circles through the Ascendant and MC, i.e.,

If $ASC \leq L_S < IC$ then S lies in the 1st Porphyry quadrant
If $IC \leq L_S < DESC$ then S lies in the 2nd Porphyry quadrant
If $DESC \leq L_S < MC$ then S lies in the 3rd Porphyry quadrant
If $MC \leq L_S < ASC$ then S lies in the 4th Porphyry quadrant

Now define Porphyry Mundane Position (PoMP) of a body S as follows:

If S lies in the 1st Porphyry quadrant then

$PoMP_S = 90 (L_S - ASC) / (IC - ASC)$

If S lies in the 2nd Porphyry quadrant then

$PoMP_S = 90 + 90 (L_S - IC) / (DESC - IC)$

If S lies in the 3rd Porphyry quadrant then

$PoMP_S = 180 + 90 (L_S - DESC) / (MC - DESC)$

If S lies in the 4th Porphyry quadrant then

$PoMP_S = 270 + 90 (L_S - MC) / (ASC - MC)$

where L_S is the longitude of the body.

To direct a promissor P to mundane aspect A of significator S in the Porphyry system:

Let $PoMP_{AP} = PoMP_S + A$, where $PoMP_{AP}$ is the Porphyry Mundane Postion of the aspect point (on the ecliptic). Then convert this PoMP back into longitude:

If $0 \leq PoMP_{AP} < 90$ then

$L_{AP} = ASC + PoMP_{AP} \times (IC - ASC) / 90$

If $90 \leq PoMP_{AP} < 180$ then

$L_{AP} = IC + (PoMP_{AP} - 90) (DESC - IC) / 90$

If $180 \leq PoMP_{AP} < 270$ then

$L_{AP} = DESC + (PoMP_{AP} - 180) (MC - DESC) / 90$

If $270 \leq PoMP_{AP} < 360$ then

$L_{AP} = MC + (PoMP_{AP} - 270) (ASC - MC) / 90$

Then use this longitude of the aspect point together with the declination of the promissor in Formula A6. The resulting RA is subtracted from the RA of the promissor to obtain the arc of direction P A S Porph mund.

Example: MO TRI SA Porph mund d: $PoMP_{SA} = 39.44$; Aspect = -120, hence $PoMP_{AP} = 279.44$, and $L_{AP} = 13.44 + 11.75 = 25.19$; $D_{MO} = 11.23$, so from Formula A6, RA = 22.75; $RA_{MO} = 28.47$, hence Arc = 5.72.

THE ALCABITIUS SYSTEM

In the Alcabitius system (Figure VI-4) the 11th and 12th house cusps are obtained by trisecting the diurnal semi-arc of the Ascendant and projecting the trisection points onto the ecliptic with hour circles. The 2nd and 3rd house cusps are similarly obtained by trisecting the nocturnal semi-arc of the Ascendant, and the western house cusps are obtained by trisecting the appropriate semi-arc of the Descendant. Two points are considered to be conjunct in the Alcabitius system if they lie on the same hour circle (have the same RA), and therefore primary directions in the Alcabitius system are the same as those in the Meridian system, with the exception of mundane aspectual directions. Alcabitius mundane aspectual directions can be defined in the same way as in the Meridian system, but it can also be argued that they should be defined quadrant-wise, as in Porphyry.

Redefine the quadrants as follows:

If $RA_{ASC} \leq RA_S < RAIC$ then S lies in the 1st Alcabitius quadrant

If $RAIC \leq RA_S < RA_{DESC}$ then S lies in the 2nd Alcabitius quadrant

If $RA_{DESC} \leq RA_S < RAMC$ then S lies in the 3rd Alcabitius quadrant

If $RAMC \leq RA_S < RA_{ASC}$ then S lies in the 4th Alcabitius quadrant

That is, the redefined quadrants are delimited by the meridian (as usual), but the hour circle through the Ascendant and

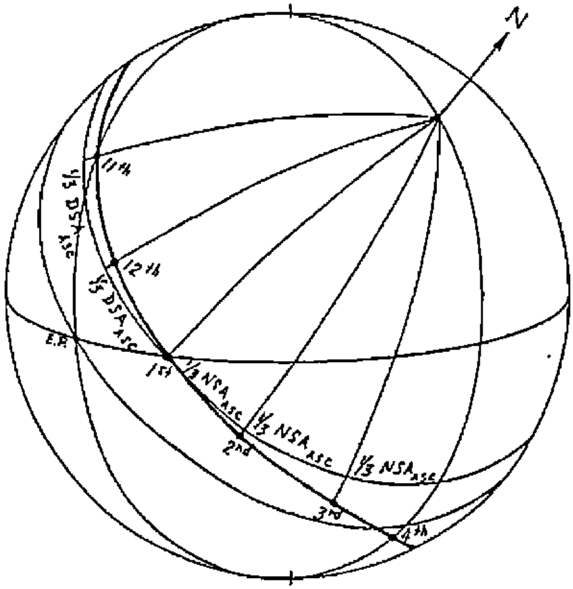

Figure VI-4

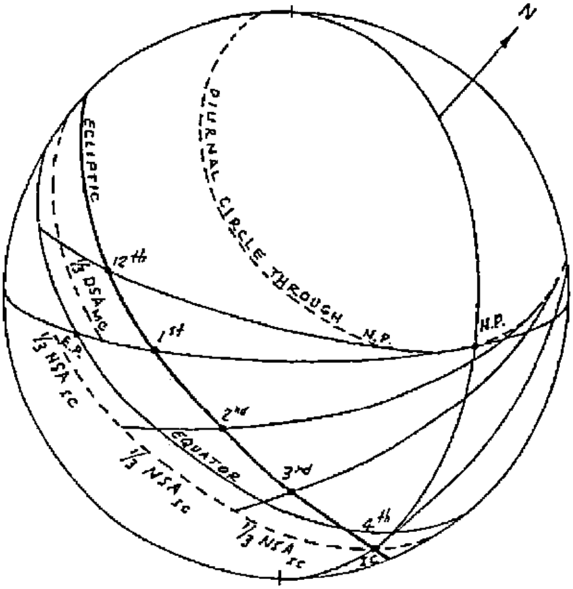

Figure VI-5

Descendant replaces the horizon. Then Alcabitius Mundane Position (AMP) of a body S can be defined as follows:

If S lies in the 1st Alcabitius quadrant then
$AMP_S = 90 (RA_S - RA_{ASC}) / NSA_{ASC}$
If S lies in the 2nd Alcabitius quadrant then
$AMP_S = 90 + 90 (RA_S - RAIC) / DSA_{ASC}$
If S lies in the 3rd Alcabitius quadrant then
$AMP_S = 180 + 90 (RA_S - RA_{DESC}) / NSA_{ASC}$
If S lies in the 4th Alcabitius quadrant then
$AMP_S = 270 + 90 (RA_S - RAMC) / DSA_{ASC}$

Then to direct promissor P to mundane aspect A of significator S in the Alcabitius system, let $AMP_{AP} = AMP_S + A$, where AMP_{AP} is the Alcabitius Mundane Position of the aspect point to the significator. Convert AMP_{AP} to RA as follows:

If $0 \leq AMP_{AP} < 90$ then
$RA_{AP} = RA_{ASC} + AMP_{AP} \times NSA_{ASC} / 90$
If $90 \leq AMP_{AP} < 180$ then
$RA_{AP} = RAIC + (AMP_{AP} - 90) \times DSA_{ASC} / 90$
If $180 \leq AMP_{AP} < 270$ then
$RA_{AP} = RA_{DESC} + (AMP_{AP} - 180) \times NSA_{ASC} / 90$
If $270 \leq AMP_{AP} < 360$ then
$RA_{AP} = RAMC + (AMP_{AP} - 270) \times DSA_{ASC} / 90$

The RA_{AP} of the aspect point to the significator is then subtracted from the RA of the promissor to obtain the arc of direction P A S Alc mund.

Example: MO TRI SA Alc mund d: $AMP_{SA} = 41.53$; Aspect = -120, hence $AMP_{AP} = 281.53$; $RA_{AP} = 12.37 + 14.80 = 27.17$; $RA_{MO} = 28.47$; hence Arc = 1.30.

THE KOCH SYSTEM

In the Koch (or Birthplace) house system (Figure VI-5) the diurnal semi-arc of the MC is trisected, and the trisection points are projected onto the ecliptic with ascension circles.* Ascension circles are great circles which are tangent to the diurnal circles through the North and South points on the horizon. Every point on the celestial sphere with declination less than the colatitude of the birthplace lies on two such circles - one a circle of ascension (the horizon circle at the moment the point rises) and the other a circle of descension (the horizon circle at the moment the point sets). Thus the Nth Koch house cusp is the point on the ecliptic having the same oblique ascension (or descension, if west of the meridian) as the point whose RA and declination are: $RA = RAMC + M \times DSA_{MC} / 3$ and $D = D_{MC}$, where DSA_{MC} is the diurnal semi-arc of the MC and D_{MC} is its declination, and: M = 1 when N = 11, M = 2 when N = 12, M = 4 when N = 2, etc.

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*Beneath the horizon what is actually being trisected is the NSA of the IC.

KOCH MUNDANE CONJUNCTIONS

Two points are considered to be conjunct in the Koch system if they lie on the same ascension circle, i.e., if they have the same oblique ascension (if east of the meridian) or oblique descension (if west). To direct a promissor P to mundane conjunction with significator S: the point on the promissor's diurnal circle which has the same OA as S has RA = $OA_S + AD_P$, where AD_P is the ascensional difference of the promissor (Formula I-1). Hence the arc of direction equals $RA_P - OA_S - AD_P = OA_P - OA_S$. That is, the arc of direction of P CONJ S Koch mund equals $OA_P - OA_S$ if S is east of the meridian, and $OD_P - OD_S$ if S is west of the meridian.
Example: SU CONJ ME Koch mund d: $OD_{SU} = 205.31$, $OD_{ME} = 199.49$; hence Arc = 5.82.

KOCH ZODIACAL DIRECTIONS

In Koch zodiacal directions, the value of the aspect is added to the longitude of the promissor, and the RA and declination corresponding to this longitude are obtained from Formulas A2 and A4. The declination is used in Formula I-1 to obtain the ascensional difference of the aspect point, and the RA and AD of the aspect point are used in Formula II-1 or II-2 to obtain the OA or OD of the aspect point (depending on whether the significator is east or west of the meridian). Then the OA or OD of the significator is subtracted from the OA or OD of the aspect point to obtain the arc of direction. Koch zodiacal directions computed in this fashion have also been called "Johndro directions" (Jayne I).
Example: MO TRI SA Koch zod c: $L_{MO} = 30.44$; Aspect = 120; hence $L_{AP} = 150.44$; from Formula A2, the $RA_{AP} = 152.50$; from Formula A4, the $D_{AP} = 11.32$; from Formula I-1, $AD_{AP} = 14.58$; from Formula II-1, $OA_{AP} = 137.92$; $OA_{SA} = 143.60$; hence Arc = -5.68.

KOCH FIELD PLANE DIRECTIONS

In Koch field plane directions the value of the aspect is added to the promissor's longitude to obtain the longitude of the aspect point; then this longitude is used with the celestial latitude of the field plane body in Formula A5 to obtain the declination and in Formula A6 to obtain the RA of the aspect point. The AD of the aspect point is computed from Formula I-1, and the OA (if the significator is east of the meridian) or OD (if west) of the aspect point is computed from Formula II-1 or II-2. Then the OA (or OD) of the significator is subtracted from the OA (or OD) of the aspect point to obtain the arc of direction.
Example: MO TRI SA Koch c in the field plane of the moon when next it trines Saturn: when the moon next arrives at 0 VI 26 its celestial latitude is 4 N 41, hence from Formula A5 its declination = 15.70 and from Formula A6 its RA = 154.22; from Formula I-1 its AD = 20.69; from Formula II-1 its OA = 133.53; $OA_{SA} = 143.60$; hence Arc = -10.07.

KOCH MUNDANE ASPECTUAL DIRECTIONS

Koch mundane aspectual directions can be computed by adding the value of the aspect to the OA (or OD) of the significator and subtracting the sum from the OA (or OD, if significator is west) of the promissor to obtain the arc of direction. However, it can also be argued that Koch mundane aspectual directions should be defined in a quadrant-wise fashion, even though any such definition runs into several problems.

In the first place, no Mundane Position can be assigned to a circumpolar body ($|D| \geq \text{co}\ \phi$) since no ascension circle can pass through such a body (it cannot rise or set).

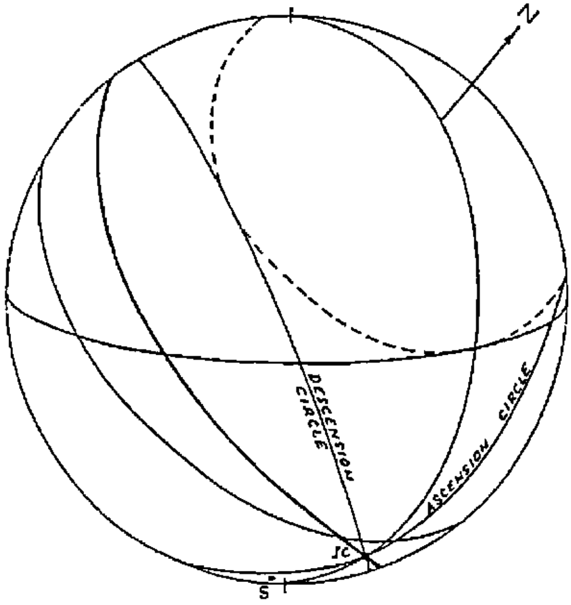


Figure VI-6

In the second place, there is an area of "house overlap" on either side of the meridian (south of the IC and north of the MC) in which Mundane Position cannot be uniquely assigned. This is because the Koch houses are delimited by circles of equal OA east of the meridian and by circles of equal OD west of it. Thus the Koch quadrants are delimited by the horizon as usual, but the two ascension circles passing through the MC and IC replace the meridian. Points lying in the area around the meridian between these two circles have two Mundane Positions, one in OA and one in OD. It is possible (Figure VI-6) for a body S (such as the comet in Prince Charle's horoscope) which lies east of the meridian to rise after the longitude of the IC does ($OA_S > OA_{IC}$), therefore such a body should properly be placed in the Koch 4th house rather than the 3rd. However, this same body will have an OD less than that of the IC, hence will set before it, and therefore it should be placed in the Koch 3rd house rather than the 4th.

One way of overcoming this difficulty is to adopt the standard quadrant delimiters (horizon and meridian) together with the following definition of Koch Mundane Position (KMP):

If S lies in the 1st Quadrant then
$KMP_S = 90 (OA_S - OA_{ASC}) / DSA_{MC}$
If S lies in the 2nd Quadrant then
$KMP_S = 90 + 90 (OD_S - OD_{IC}) / DSA_{MC}$
If S lies in the 3rd Quadrant then
$KMP_S = 180 + 90 (OD_S - OD_{DESC}) / DSA_{MC}$
If S lies in the 4th Quadrant then
$KMP_S = 270 + 90 (OA_S - OA_{MC}) / DSA_{MC}$

where KMP_S is the Koch Mundane Position of S. Observe, however, that by this definition it is possible for a body which lies in the 1st Quadrant to have a KMP > 90; for a body in the 2nd Quadrant to have a KMP < 90; for a body in the 3rd Quadrant to have a KMP > 270; and for a body in the 4th Quadrant to have a KMP < 270. For example, $KMP_{CO} = 115.57$, hence the comet lies within 5 degrees of the fifth Koch house cusp even though it is east of the meridian.

Then to direct a promissor P to mundane aspect A of significator S in the Koch system, let $KMP_{AP} = KMP_S + A$, where KMP_{AP} is the Koch Mundane Position of the aspect point. Then convert KMP_{AP} into OA (or OD) as follows:

If $0 \leq KMP_{AP} < 90$ then
$OA_{AP} = OA_{ASC} + DSA_{MC} \times KMP_{AP} / 90$
If $90 \leq KMP_{AP} < 180$ then
$OD_{AP} = OD_{IC} + DSA_{MC} (KMP_{AP} - 90) / 90$
If $180 \leq KMP_{AP} < 270$ then
$OD_{AP} = OD_{DESC} + DSA_{MC} (KMP_{AP} - 180) / 90$
If $270 \leq KMP_{AP} < 360$ then
$OA_{AP} = OA_{MC} + DSA_{MC} (KMP_{AP} - 270) / 90$

Then subtract OA_{AP} (or OD_{AP}) from OA (or OD) of the promissor (depending on whether the aspect point is east or west of the meridian) to obtain the arc of direction of P A S Koch mund.
Example: MO TRI SA Koch mund c: $KMP_{SA} = 38.37$; Aspect = -120, hence $KMP_{Ap} = 278.37$ and $OA_{Ap} = 14.66$; $OA_{MO} = 14.01$, hence Arc = -0.65.

PROJECTION SYSTEMS SPECULUM FOR PRINCE CHARLES

	RA	DEC	ZA	RL	PoMP	AMP	KMP
SUN	230.01	-18.38	234.78	232.42	121.31	119.33	108.29
MOON	28.47	11.23	32.64	30.59	283.65	282.55	277.77
MERCURY	215.22	-12.17	219.36	217.58	108.89	107.81	102.86
VENUS	195.79	- 4.77	197.76	197.13	92.36	92.67	93.81
MARS	260.08	-24.07	261.69	260.88	144.22	142.77	127.46
JUPITER	269.87	-23.38	269.90	269.88	151.40	150.39	137.72
SATURN	157.63	10.92	153.34	155.84	39.44	41.53	38.37
URANUS	89.93	23.65	89.94	89.94	331.43	330.44	317.33
NEPTUNE	193.60	- 4.17	195.34	194.77	90.55	90.96	92.49
PLUTO	141.49	23.07	134.09	139.06	14.65	19.02	6.28
CHIRON	236.71	-16.70	240.40	238.93	125.97	124.55	116.88
COMET	187.69	-26.52	199.46	188.37	93.63	83.47	115.57
NODE	32.68	13.18	37.31	34.96	287.28	285.83	279.20
ASC	127.86	18.90	123.20	125.50	0.	0.	0.
MC	12.37	5.30	14.60	13.44	270.	270.	270.

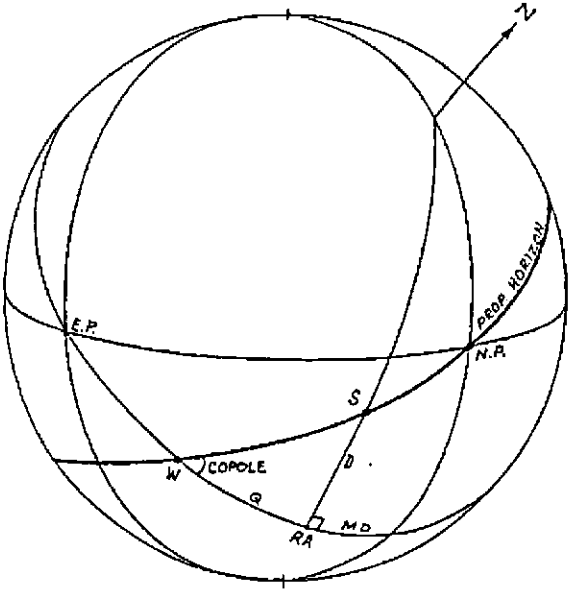


Figure VII-1

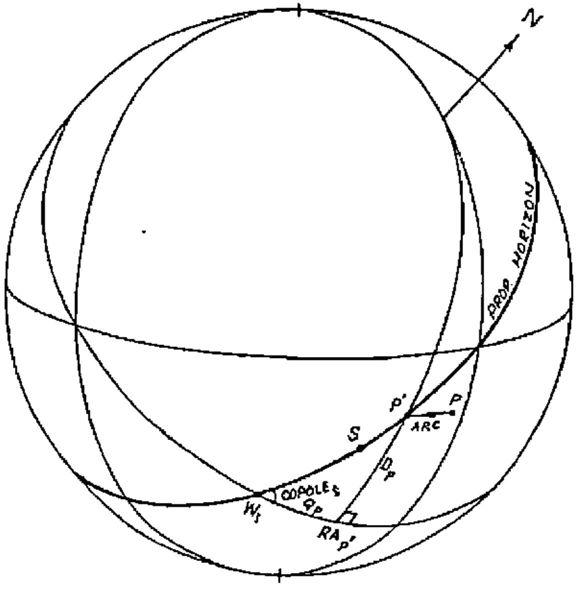


Figure VII-2

CHAPTER VII: THE PLACIDUS SYSTEM

In the Placidus system the 11th and 3rd house cusps are the ecliptic points in the 4th and 1st Quadrants (respectively) whose ratios of meridian distance to semi-arc = 1 / 3, and the 12th and 2nd house cusps are the ecliptic points in the 4th and 1st Quadrants (respectively) whose ratios of MD to SA = 2 / 3.* That is, the Placidus cusps are the ecliptic points which have progressed 1 / 3 and 2 / 3 of the way through their respective quadrants.

In the Placidus system two points are considered to be conjunct if they lie in the same quadrant and if they have the same ratio of meridian distance to semi-arc (i.e., if they are proportionately the same distance from the meridian along their respective diurnal circles).

In the past the calculations for primary directions in the Placidus system have sometimes been carried out incorrectly (Simmonite, de Luce, et. al. They are described correctly by Leo, but with an algorithm unsuitable for computers). Before describing a more correct method of carrying out these calculations, this incorrect method will be described and refuted.

THE INCORRECT PLACIDUS METHOD

The proportional horizon of a body S is defined to be the locus of points on the celestial sphere which have the same ratio of meridian distance to semi-arc as the body (Figure VII-1). Let W be the point of intersection (and its RA) of the body's proportional horizon and the equator. Let Q be the difference between the body's W and its RA. The meridian distance of W is given by: $MD_W = Q + MD$, where MD is the meridian distance of the body. Since W is an equatorial point, its declination equals zero and its semi-arc equals 90. And since the ratio of MD_W to SA_W must equal the ratio of MD to SA of the body (since by definition W lies on the proportional horizon of S),

$MD_W \; / \; SA_W = (Q + MD) \; / \; 90 = MD \; / \; SA$ so

$Q = (90 - SA) \times MD \; / \; SA = AD \times MD \; / \; SA$

where AD is the ascensional difference of the body (nocturnal semi-arcs are used since S lies in the 1st Quadrant). Then the body's W is given by:

If S lies in the 1st or 4th Quadrants then $W = RA - Q$

If S lies in the 2nd or 3rd Quadrants then $W = RA + Q$

Example: SUN: $MD_{SU} = 37.64$; $SA_{SU} = 114.70$; $AD_{SU} = -24.70$; hence $Q_{SU} = -8.11$; $RA_{SU} = 230.01$; hence $W_{SU} = 221.90$

MOON: $MD_{MO} = 16.10$; $SA_{MO} = 104.46$; $AD_{MO} = 14.46$; hence $Q_{MO} = 2.23$; $RA_{MO} = 28.47$; hence $W_{MO} = 26.24$

*Here "MD / SA" means UMD / DSA for a point above the horizon and LMD / NSA for a point below the horizon. I.e., in this context MD can exceed 90.

So far so good. Now define the body's copole to be the angle between the body's proportional horizon and the equator. By Rule 10, $\sin Q = \tan D \cot \text{copole}$ or

$\text{pole} = \text{Arctan}(\sin Q \cot D)$.

To direct a promissor P to mundane conjunction with significator S (Figure VII-2), let $RA_{P'}$ be the RA of the point of intersection of the promissor's diurnal circle with the significator's proportional horizon. Let Q_P be the difference between $RA_{P'}$ and W_S. Consider the triangle whose sides are arcs of the equator (= Q_P), the hour circle through P' (= D_P), and the significator's proportional horizon. The angle between the equator and the proportional horizon equals copole_S. By Rule 10,

$\sin Q_P = \tan D_P \cot \text{copole}_S$ or

$Q_P = \text{Arcsin}(\tan D_P \tan \text{pole}_S)$

and $RA_{P'} = W_S + Q_P$.

The arc of direction is given by: $\text{Arc} = RA_P - RA_{P'}$

$= RA_P - W_S - Q_P$

$= W_P - W_S$

where W_P is promissor's analogy of W, given by : $W_P = RA_P - Q_P$ (since the significator is east of the meridian)

Now consider Figure VII-3, which shows the semi-arcs and meridian distances of several points which have different diurnal circles (declinations) but which all lie on the same proportional horizon (i.e., which have the same ratio of MD to SA). Observe that as one moves along the proportional horizon towards the meridian (from P_6 to P_1), MD diminishes and hence SA must diminish as well to maintain a constant ratio; therefore any proportional horizon must pass through the North (and South) points on the horizon, or at least approach these points as a limit. Therefore the proportional horizon as defined in the incorrect Placidus method must be a house circle, and therefore a body's Q and W in the incorrect Placidus method must be the same as the body's Campanus-Regiomontanus Q and W. However, from the above examples, it is clear that they are not the same:

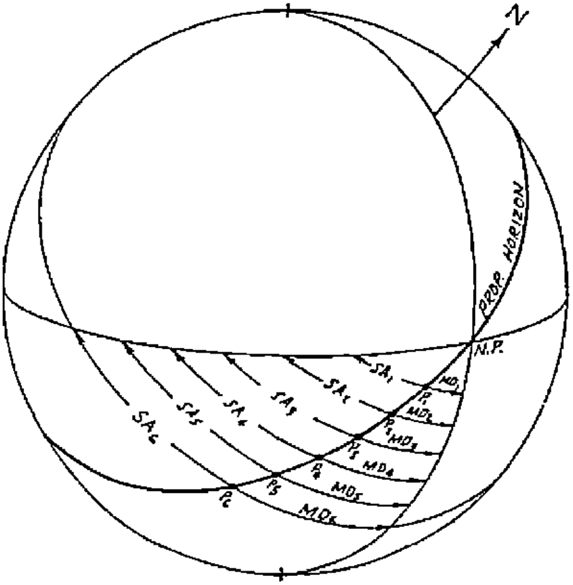


Figure VII-3

	Incorrect Placidus		Campanus-Regiomontanus	
	Q	W	Q	W
SUN	-8.11	221.90	-10.85	219.16
MOON	2.23	26.24	3.20	25.27

The problem lies in the assumption that the proportional horizon as defined in the incorrect Placidus method is a great circle (and if it is any kind of circle at all it must be a great circle, since it passes through the North and South points). For if it were a great circle, it would be a house circle. Since it is not a great circle, it is not correct to use Napier's rules to solve for $pole_S$ and Q_P. The Placidus system is the only non-projection system considered in this book, i.e., the only system in which the loci of points of equal Mundane Position are not great circles on the celestial sphere.

Rather than try to revise the incorrect Placidus method, it is easier to discard it altogether and start from the definition of Mundane Position in the Placidus system.

THE CORRECT PLACIDUS METHOD

To direct a promissor P to mundane conjunction with a significator S, it is necessary to find that point P' on the promissor's diurnal circle which has the same ratio of MD to SA as does the significator, i.e., $MD_{P'} / SA_{P'} = MD_S / SA_S$. Then the arc of direction equals $RA_P - RA_{P'}$. Assume that P and S are in the 1st Quadrant, so nocturnal semi-arcs are to be used. Then $SA_{P'} = 90 - AD_P$ (since $D_{P'} = D_P$), where AD_P is the promissor's ascensional difference. Also, $MD_{P'} = RAIC - RA_{P'}$, hence $RAIC - RA_{P'} = (90 - AD_P) \times MD_S / SA_S$, whence

$$Arc = RA_P - RAIC + (90 - AD_P) \times MD_S / SA_S.$$

The general algorithm for computing the arc of direction of a promissor P directed to mundane conjunction with a significator S in the Placidus system is:

1. If the significator lies in the 1st or 3rd Quadrants then
   let T = 1
   If the significator lies in the 2nd or 4th Quadrants then
   let T = -1

2. If the significator lies in the 1st or 2nd Quadrants then
   let V = -1 and let R = RAIC
   If the significator lies in the 3rd or 4th Quadrants then
   let V = 1 and let R = RAMC

3. The arc of direction of P CONJ S Plac mund is given by:

$$Arc = RA_P - R + T \times (90 + V \times AD_P) \times MD_S / SA_S$$

where RA_P is the promissor's RA and AD_P is its ascensional difference (from Formula I-1), and MD_S and SA_S are the meridian distance and semi-arc of the significator. The arc is positive if the direction is direct and negative if it is converse.

Observe that if the MC is significator, then $MD_S = 0$, hence $Arc = RA_P - RAMC$. And if the Ascendant is significator, then $MD_S / SA_S = 1$, hence

$$\begin{aligned}\text{Arc} &= RA_P - RAIC + 90 - AD_P\\ &= (RA_P - AD_P) - (RAIC - 90)\\ &= OA_P - OA_{ASC}.\end{aligned}$$

Example: SU CONJ ME Plac mund d: $T = -1$; $V = -1$; $R = 192.37$; $RA_{SU} = 230.01$; $AD_{SU} = -24.70$; $MD_{ME} / SA_{ME} = .21612$; hence

$$\text{Arc} = 230.01 - 192.37 - (.21612)\ (90 + 24.70) = 12.85$$

PLACIDUS ZODIACAL DIRECTIONS

To compute a Placidus zodiacal direction, the value of the aspect is added to the promissor's longitude to obtain the longitude of the aspect point. Use the longitude of the aspect point in Formulas A2 and A4 to obtain the RA and declination of the aspect point. Use the declination cf the aspect point in Formula I-1 to obtain the AD of the aspect point, thence proceed as for a mundane conjunction, using the RA and AD of the aspect point for RA_P and AD_P.

Example: MO TRI SA Plac zod c: $L_{MO} = 30.44$; Aspect = 120; hence $L_{AP} = 150.44$; from Formula A2, the $RA_{AP} = 152.50$; from Formula A4, $D_{AP} = 11.32$; from Formula I-1, $AD_{AP} = 14.58$; $MD_{SA} / SA_{SA} = .45729$; $T = 1$; $V = -1$; $R = 192.37$; hence Arc Arc = -5.38.

PLACIDUS FIELD PLANE DIRECTIONS

To compute a Placidus field plane direction, the value of the aspect is added to the promissor's longitude to obtain the longitude of the aspect point. This longitude is used with the celestial latitude of the field plane body in Formulas A5 and A6 to obtain the declination and RA of the aspect point. Use the declination of the aspect point in Formula I-1 to obtain the AD of the aspect point, thence proceed as for a mundane conjunction, using the RA and AD of the aspect point for RA_P and AD_P.

Example: MO TRI SA Plac c in the field plane of the moon when next it trines Saturn: $L_{AP} = 150.44$; $B_{AP} = 4.68$; hence from Formula A5, $D_{AP} = 15.70$; from Formula A6, $RA_{AP} = 154.22$; from Formula I-1, $AD_{AP} = 20.69$; $MD_{SA} / SA_{SA} = .45729$; $T = 1$; $V = -1$ $R = 192.37$; hence Arc = -6.46.

PLACIDUS MUNDANE PARALLELS

In the Placidus system two points are considered to be in mundane parallel if they lie on opposite sides of the meridian but the same side of the horizon and have the same ratios of MD / SA. A mundane contraparallel occurs when the two points are on the same side of the meridian but opposite sides of the horizon and have the same ratios of MD / SA.

Thus to direct a promissor P to mundane parallel with significator S in the Placidus system, reverse the sign of T in Step 1, then proceed with steps 2 and 3 of the Placidus mundane conjunction algorithm.

To direct a promissor P to mundane contraparallel with

significator S, reverse the signs of T and V in Steps 1 and 2, and change RAIC to RAMC and vice versa in Step 2 of the Placidus mundane conjunction algorithm, then proceed with Step 3.
Example: SA || ME Plac mund c: $RA_{SA} = 157.63$; $AD_{SA} = 14.03$; $MD_{ME} / SA_{ME} = .21612$; $T = 1$; $V = -1$: $R = 192.37$; hence Arc = -18.32.

PLACIDUS MUNDANE ASPECTUAL DIRECTIONS

To compute Placidus mundane aspectual directions it is convenient to define Placidus Mundane Position (PMP) of the significator as follows:

If the significator lies in the 1st Quadrant then
$PMP_S = 90 - 90\ MD_S / SA_S$
If the significator lies in the 2nd Quadrant then
$PMP_S = 90 + 90\ MD_S / SA_S$
If the significator lies in the 3rd Quadrant then
$PMP_S = 270 - 90\ MD_S / SA_S$
If the significator lies in the 4th Quadrant then
$PMP_S = 270 + 90\ MD_S / SA_S$

where MD_S is the meridian distance of the significator and SA_S is its semi-arc. Observe that in the Placidus system (as in Koch) no Mundane Position can be assigned to circumpolar bodies, since such bodies have no semi-arcs.

Then to direct promissor P to mundane aspect A of significator S, let the Placidus Mundane Position of the aspect point be given by: $PMP_{AP} = PMP_S + A$, where PMP_S is the Placidus Mundane Position of the significator and A is the value of the aspect. Next, compute the MD / SA ratio for this value of PMP_{AP}:

If $0 \le PMP_{AP} < 90$ then $MD / SA = 1 - PMP_{AP} / 90$
If $90 \le PMP_{AP} < 180$ then $MD / SA = PMP_{AP} / 90 - 1$
If $180 \le PMP_{AP} < 270$ then $MD / SA = 3 - PMP_{AP} / 90$
If $270 \le PMP_{AP} < 360$ then $MD / SA = PMP_{AP} / 90 - 3$

where MD / SA is the MD to SA ratio of the aspect point. Thence proceed as for a mundane conjunction, using this MD / SA ratio of the aspect point for the significator's MD / SA, and taking the values of T, V, and R for the quadrant in which the aspect point lies (if $0 \le PMP_{AP} < 90$ then AP lies in the 1st Quadrant;
if $90 \le PMP_{AP} < 180$ then AP lies in the 2nd Quadrant;
if $180 \le PMP_{AP} < 270$ then AP lies in the 3rd Quadrant;
if $270 \le PMP_{AP} < 360$ then AP lies in the 4th Quadrant).
Example: MO TRI SA Plac mund c: $PMP_{SA} = 48.84$; Aspect = -120; hence $PMP_{AP} = 288.84$; $MD / SA = .20933$; $RA_{MO} = 28.47$; $AD_{MO} = 14.46$; $T = -1$; $V = 1$; $R = 12.37$; hence Arc = -5.77.

PLACIDUS SPECULUM FOR PRINCE CHARLES

	L	D	RA	MD	SA	MD/SA	PMP
SUN	232.42	-18.38	230.01	37.64	114.70	.32816	119.53
MOON	30.44	11.23	28.47	16.10	104.46	.15413	283.87
MERCURY	216.96	-12.17	215.22	22.85	105.73	.21612	109.45
VENUS	196.38	- 4.77	195.79	3.42	96.02	.03562	93.21
MARS	260.95	-24.07	260.08	67.71	124.16	.54534	139.08
JUPITER	269.89	-23.38	269.87	77.50	122.93	.63044	146.74
SATURN	155.27	10.92	157.63	34.74	75.97	.45729	48.84
URANUS	89.93	23.65	89.93	77.56	123.40	.62853	326.57
NEPTUNE	194.13	- 4.17	193.60	1.23	95.25	.01291	91.16
PLUTO	136.56	23.07	141.49	50.88	57.63	.88287	10.54
CHIRON	238.23	-16.70	236.71	44.34	112.16	.39533	125.58
COMET	197.96	-26.52	187.69	4.68	128.85	.03632	86.73
NODE	34.96	13.18	32.68	20.31	107.13	.18958	287.06
ASC	125.50	18.90	127.86	115.49	115.49	1.	0.
MC	13.44	5.30	12.37	0.	96.70	0.	270.

ASCENSIONAL DEFINITION OF MUNDANE POSITION

Recent interest in new house systems (Koch, Topocentric) has tended to focus upon the idea of measuring diurnal rotation in terms of ascension rather than culmination. Ideally an ascensional house system would evenly divide the equator, and project the division points onto the ecliptic with ascension circles. In such a system the house cusps would be the actual ascending degrees at two hour intervals. However, while such a system would retain the Ascendant as a house cusp, it would lose the rest of the angles, moreover opposite house cusps would not be located 180 degrees apart in longitude.

The Koch system represents an attempt to maintain the view of Mundane Position as essentially a function of ascension, yet modify the concept to retain the angles as house cusps (by dividing the DSA of the MC instead of the equator) and have opposite house cusps opposite in the zodiac (by substituting OD for OA on the western side of the meridian).

The Topocentric system also retains opposite house cusps by projecting with circles of equal descension (rather than ascension) on the western side of the meridian, but it utilizes an altogether different method of retaining the MC and IC as house cusps.

VARIABLEASCENSION CIRCLES

In the Topocentric system, even divisions of the equator are projected onto the ecliptic with variable ascension circles. A variable ascension circle (Figure VIII-1) is a great circle on the celestial sphere tangent to a pair of diurnal circles of equal (but opposite) declinations. In other words, a variable ascension circle is an ascension circle for

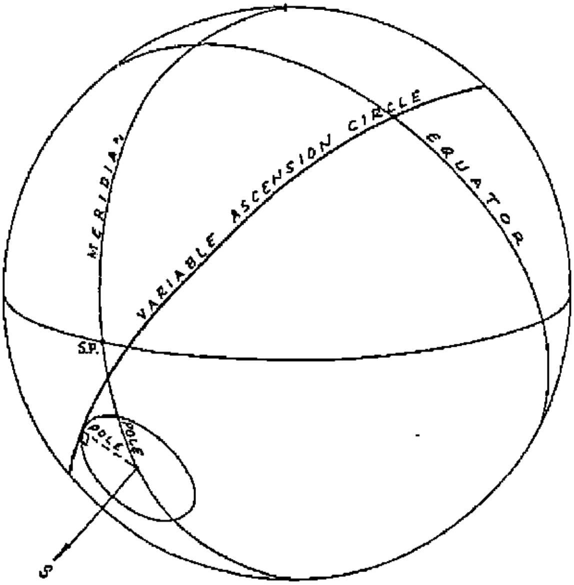


Figure VIII-1

some latitude other than the birth latitude. The pole of a variable ascension circle is the arc measured along the meridian from the celestial poles to the intersection with the diurnal circles. Evidentally, pole is numerically equal to the co-declination (90 - D) of the diurnal circles. Thus an ascension circle is a variable ascension circle whose pole = Ø, the latitude of the birthplace. An hour circle is a variable ascension circle whose pole = 0.

DEFINITION OF THE TOPOCENTRIC SYSTEM

In the Topocentric system (Figure VIII-2) the equator is divided into twelve 30 degree arcs (beginning at the East Point) and the division points are projected onto the ecliptic with variable ascension circles whose poles are given by: 10th cusp pole = 0; 11th and 3rd cusp poles = Arctan (1/3 tan Ø); 12th and 2nd cusp poles = Arctan (2/3 tan Ø); 1st cusp pole = Ø [these poles are for |Ø| < co E. For |Ø| ≥ co E, the poles are: 10th = 0; 11th and 3rd = Arctan(1/3 cot Ø $\cot^2$ E); 12th and 2nd = Arctan(2/3 cot Ø $\cot^2$E); 1st = Arctan (cot Ø $\cot^2$ E)]. The cusps are calculated from Formula A8 (Ascendant) using the Topocentric pole of the house in place of Ø, and the appropriate value of RAMC (RAMC - 90 for the 10th cusp, RAMC - 60 for the 11th cusp, RAMC - 30 for the 12th cusp, etc.). The western house cusps are obtained using the same poles but projecting with descension circles, so that opposite house cusps lie 180 degrees apart in longitude.

TOPOCENTRIC PRIMARY DIRECTIONS

Define the Topocentric pole of a body S to equal:

Formula VIII-1: $\text{pole}_S = \text{Arctan}\ (\tan \text{Ø} \times MD\ /\ SA)$

where MD / SA is the ratio of meridian distance to semi-arc of body S.

Referring to Figure VIII-3, we have by Rule 1 that A = Arcsin (sin pole_S / cos D_S), and by Rule 4 that B = Arccos (cos D_S sin A) = copole_S. Therefore, by Rule 10,

Formula VIII-2: $Q_S = \text{Arcsin}\ (\tan D_S \tan \text{pole}_S)$

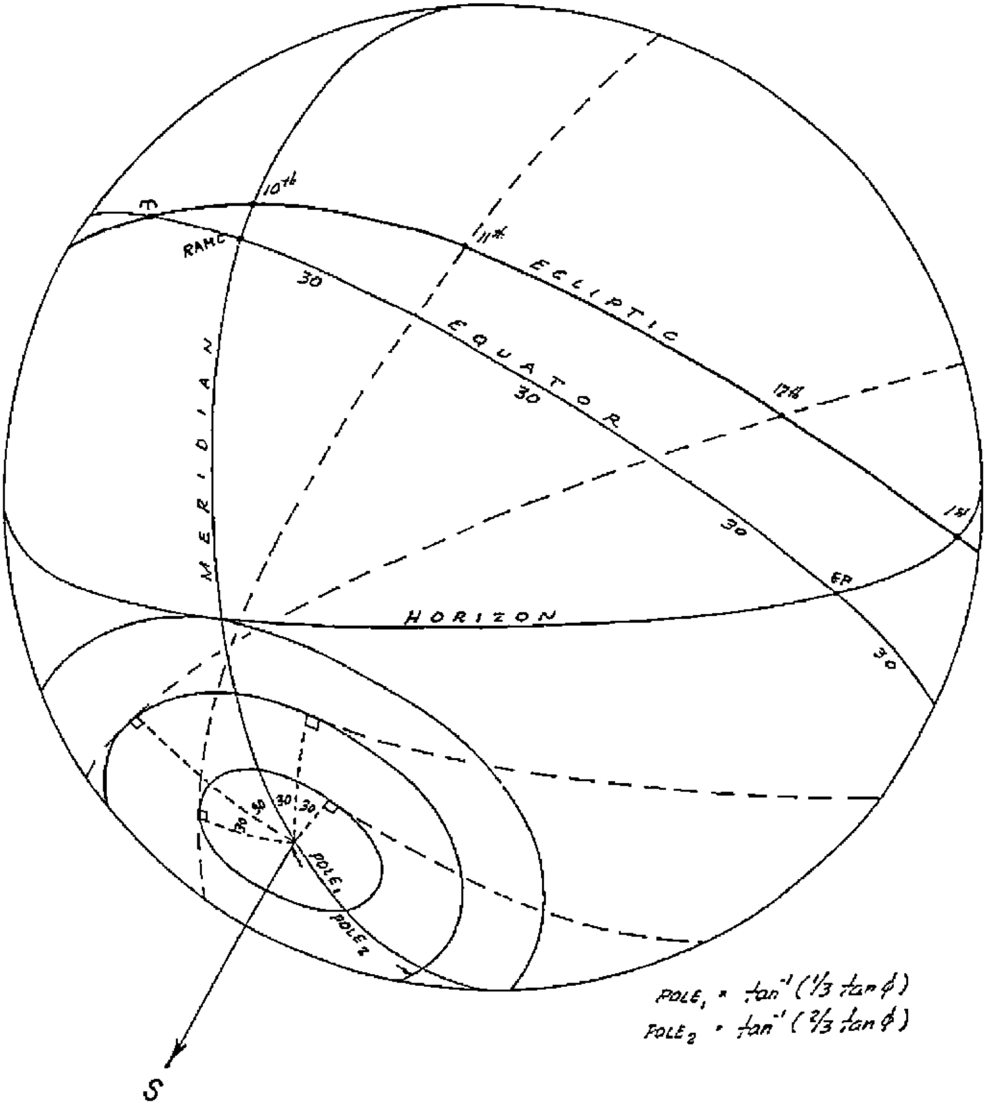
where Q_S is the Topocentric ascensional difference of significator S under its own pole. Then W_S, the oblique ascension (or descension) of S under its own pole (that is to say, the intersection of the equator and the variable ascension circle through S of pole_S) is given by:

Formula VIII-3: If Significator lies in Quadrants 1 or 4, then

$$W_S = RA_S - Q_S$$

If Significator lies in Quadrants 2 or 3, then

$$W_S = RA_S + Q_S$$



$POLE_1 = \tan^{-1}(1/3 \tan\phi)$

$POLE_2 = \tan^{-1}(2/3 \tan\phi)$

Figure VIII-2

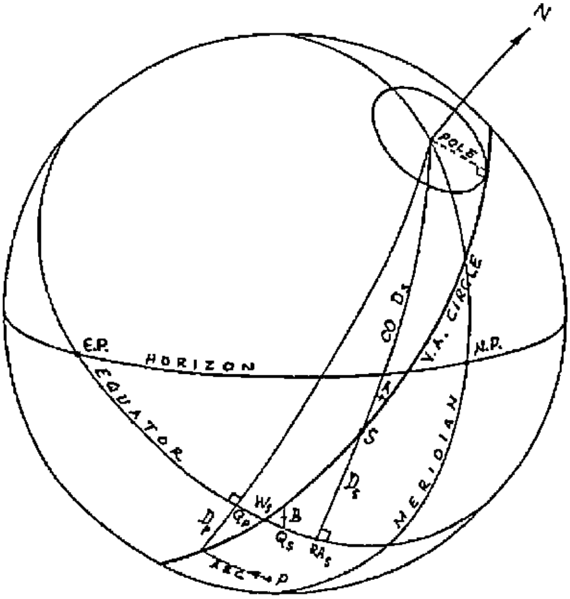


Figure VIII-3

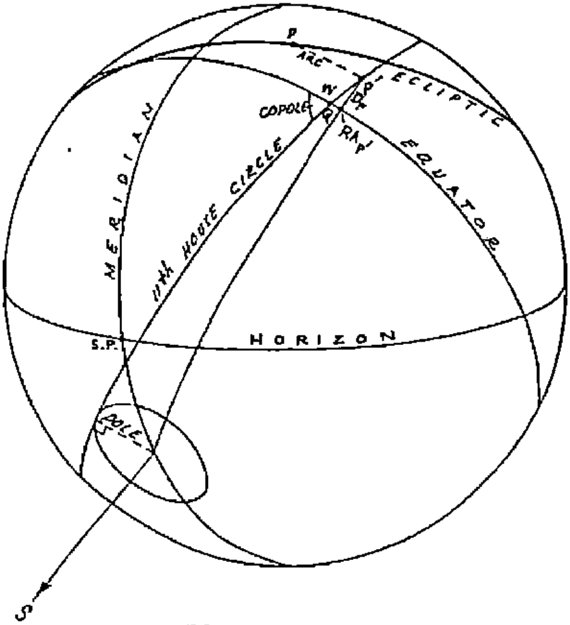


Figure VIII-4

Now Q_P, the promissor's Topocentric ascensional difference under the pole of the significator, can be computed from Rule 10:

Formula VIII-4: $Q_P = \text{Arcsin}\ (\tan D_P \tan \text{pole}_S)$

Now W_P, the promissor's analogy of W, is found by the usual rules:

Formula VIII-5: **If Significator lies in Quadrants 1 or 4, then**

$$W_P = RA_P - Q_P$$

If Significator lies in Quadrants 2 or 3, then

$$W_P = RA_P + Q_P$$

where RA_P is the RA of the promissor.

Formula VIII-6: The arc of direction of promissor P conjunct significator S (P CONJ S Topo mund) is given by:

$$Arc = W_P - W_S$$

Arc is positive in a direct direction and negative in a converse direction.

Topocentric practitioners only employ zodiacal directions, and they equate arcs to time with the Naibod measure.

Observe that when the MC is significator, $MD_S/SA_S = 0$, hence $Q_P = 0$ and $W_P = RA_P$, and since $W_S = RAMC$, $Arc = RA_P - RAMC$. When the Ascendant is significator, $MD_S/SA_S = 1$, hence $Q_P = AD_P$ and $W_P = OA_P$, and since $W_S = OA_{ASC}$, $Arc = OA_P - OA_{ASC}$.

Example: MO TRI SA Topo zod c: The aspect point has $L_{AP} = 150.44$; $RA_{AP} = 152.50$; $D_{AP} = 11.32$; Topo $\text{pole}_{SA} = 29.89$, hence $Q_{AP} = 6.61$; $W_{AP} = 145.89$; and since $W_{SA} = 151.26$, $Arc = -5.37$.

ALLEGED EMPIRICAL DERIVATION OF THE TOPOCENTRIC SYSTEM

It is claimed that the Topocentric system was derived empirically from zodiacal primary directions to intermediate house cusps equated to time with the Naibod measure. Figure VIII-4 illustrates how this was ostensibly done. Events in the life of a native which are proper to a given house (e.g., long journeys for the ninth house) were reduced from actual time to arc via the Naibod measure. Appropriate zodiacal aspects (e.g., sextile Venus, trine Saturn) were identified with the given events, and points were plotted along the diurnal circles of these aspect points at a distance from the points equal to the measures of the arcs. The great circle which joins these plotted points was taken to be the circle of the given house (although the authors of the Topocentric system claim that this locus of points is not a great circle on the celestial sphere, their formulas are great circle formulas).

For example, a zodiacal point P was identified with an event of Arc. The point P', whose $RA = RA_P + Arc$ (Figure VIII-4 illustrates a converse direction) and whose declination $= D_P$, was considered to lie upon the given house circle. Now $RA_{P'} = RA_P + Arc = Q + W$, and since by Rule 10 $\sin Q = \tan D_P \tan \text{pole}$, we have that sin ($RA_P$ + Arc - W) = tan D_P tan pole. Given two events with two values of P and two values of Arc, we thus obtain two equations in two unknowns (W and pole) and can thus solve for the W and pole of the house circle. Given enough examples computed from different horoscopes of different terrestrial latitudes, it was supposedly found that the the W's were equal to RAMC + N x 30, and the poles were equal to Arctan (M x tan Ø /3), where N and M are integers (which depend on the given house).

Given the enormous number of examples which would have been required from precisely timed horoscopes of widely differing latitudes to carry out such an analysis, together with the large number of incorrect points which would unavoidably be generated by incorrect assumptions about which zodiacal aspect produced which event, together with the overwhelming concurrence among modern practitioners of primary directions that the True Solar Arc in RA measure is correct and the Naibod measure is not, together with the high level of mathematical competence required which is not elsewhere evident in the development of Topocentric theory, it is intrinsically improbable that the claim of the empirical derivation of the Topocentric system is valid; however, it cannot be proved to be invalid.

Even if the house poles were empirically determined to equal Arctan (M x tan Ø / 3), it is not apparent how poles for significators which do not lie upon the equator were determined to equal Arctan (MD x tan Ø / SA). This determination supposedly comes out of the following model:

MODELLING THE TOPOCENTRIC POLE

In Figure VIII-5 the circle represents the earth projected onto the plane of the meridian, with the birthplace located at point G. The line passing through G which is parallel to the earth's axis is termed the Topocentric **axis**; to an observer at G, the firmament appears to rotate around this axis in the course of 24 hours, during which time the plane of the horizon (which is taken to be the plane which passes through the center of the earth and is parallel to the horizon at G) sweeps out a cone of rotation with vertex at H. The angle between the Topocentric axis and the plane of the horizon is equal to Ø, the latitude of the birthplace. The intersection of the planes of the meridian and the horizon is called the **temporal line of the horizon**.

Figure VIII-6 shows the cone's relation to the sphere. Since the sphere has infinite radius, the Topocentric axis merges with the earth's axis and the cone vertex H merges with the center of the earth. The temporal line of the horizon passes through the center of the earth and the North point. The points which lie on the eastern horizon are projected onto the temporal line of the horizon such that to each point on the eastern horizon there is assigned a distance measured along the temporal line of the horizon from the center of the earth towards the North point (which is projected onto itself). There are innumerable ways in which this can be done: in the Topocentric system, a point's distance along the temporal line of the horizon from the vertex of the cone (i.e. the center of the earth) is defined to be equal to (1 + tan D tan Ø) / sin Ø, where D is the declination

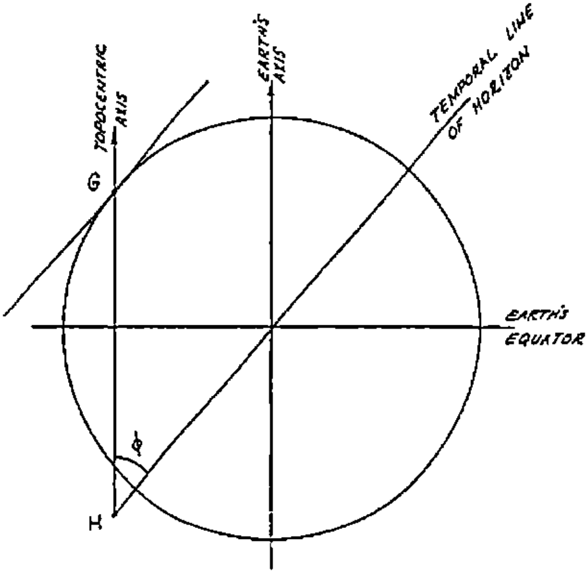


Figure VIII-5

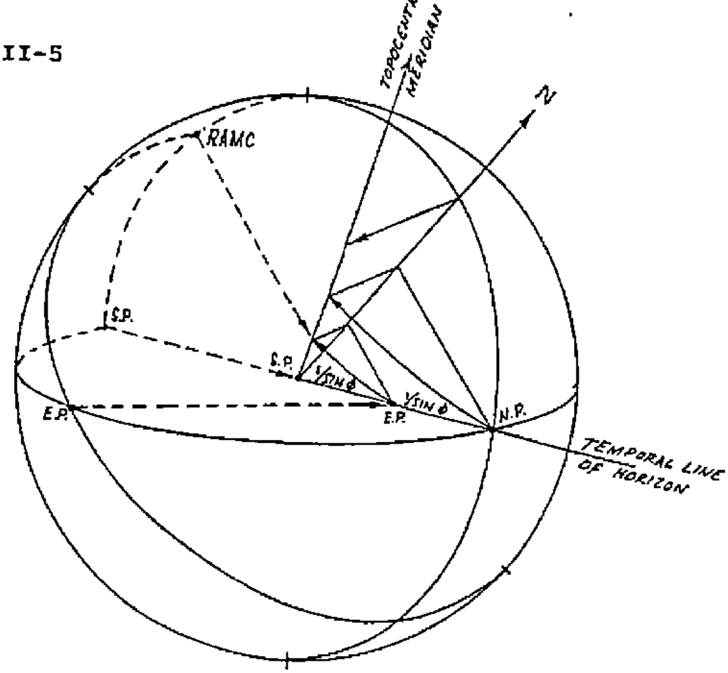


Figure VIII-6

of the point. Thus, distance = 0 when D = -co Ø (South point)
distance = 1 / sin Ø when D = 0 (East point)
distance = 2 / sin Ø when D = co Ø (North point)

Circumpolar points are projected onto the portion of the temporal line of the horizon lying beyond the North point (distance > 2 / sin Ø). This assignation arbitrarily fixes the radius of the cone in the plane of the equator at a value of one, and fixes the distance from the cone vertex along the Topocentric axis to the plane of the equator at a value of cot Ø. The distance along the Topocentric axis from the plane of the equator to the plane of rotation of a body is equal to the tangent of its declination.

In the course of six hours, the temporal line of the horizon by diurnal rotation reaches the line labelled "Topocentric meridian". Considered spherically (Figure VIII-7), the **Topocentric meridian** is the ascension circle through the RAMC, the locus of points which were on the horizon 6 hours previously, with the equatorial point now occupying the RAMC. The rotation which carries the East point to the RAMC carries P_1 to P_1' and and P_2 to P_2'. When a point lies on the Topocentric meridian it is distant from the meridian (along its diurnal circle) by an arc equal to its AD. Thus by continuously diminishing its AD in the course of rotation, a point can be brought to the meridian in exactly 6 hours (thus preserving the MC and IC).

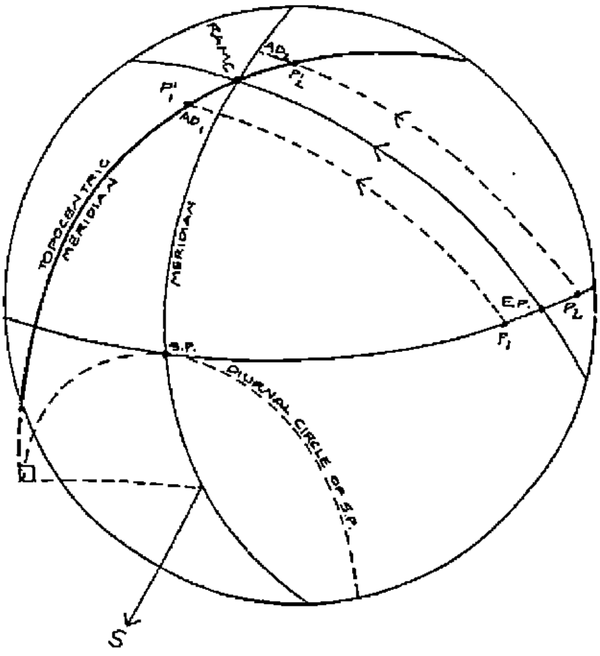


Figure VIII-7

That is to say, AD must be redefined such that Topocentric AD (Q) equals AD when a point is located on the horizon, and Topocentric AD equals zero when a point is located on the meridian.

Conceivably one could do this by continuously diminishing a body's declination in the course of rotation (i.e. regarding all diurnal circles as great circles converging upon the RAMC and RAIC); however, in the Topocentric system it is done by continuously diminishing Ø (i.e., by moving the horizon towards the north and south celestial poles in the course of rotation). At

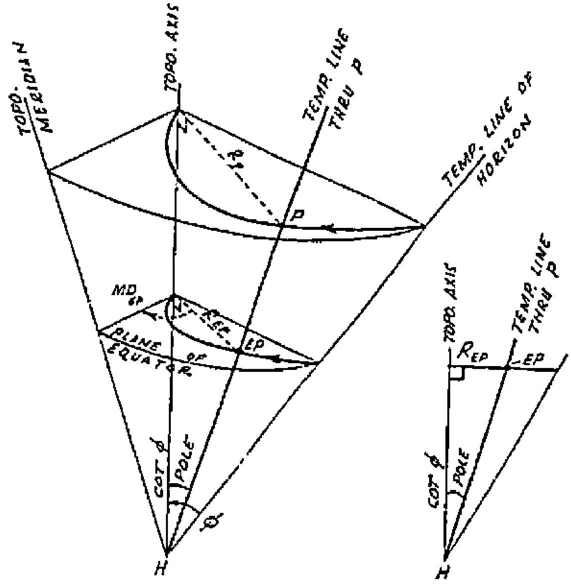


Figure VIII-8

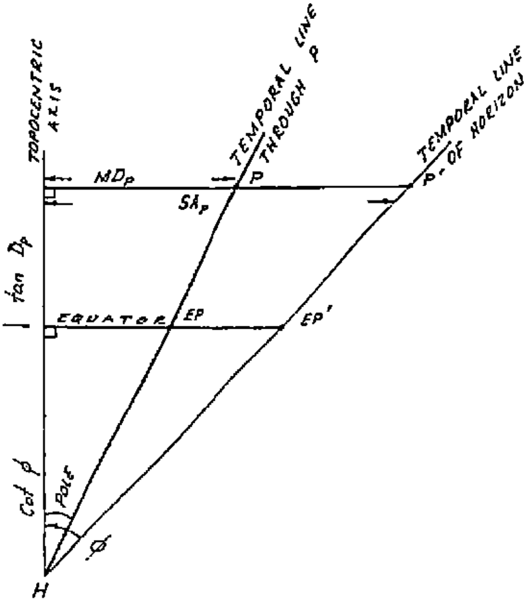


Figure VIII-9

this point, therefore, the cone must be abandoned in favor of a foil (which is an Archimedean spiral rather than a circle in cross section - Figure VIII-8). Let P be a point located in the 4th Quadrant. Define the temporal line through P to be the line joining P and the vertex of the cone-foil. Let EP be the equatorial point which lies on the temporal line through P. Note that in the cone model, the point EP would be the East point at the moment P rose, i.e., on the cone temporal lines are lines of equal ascension, which correspond to ascension circles on the sphere. On the foil, however, temporal lines are lines of equal ascension for some latitude other than the birth latitude, and correspond to variable ascension circles on the sphere. In abandoning the cone model for the foil model, we are no longer modelling the earth's rotation, since it is not true that an observer on earth, following the trajectory of a celestial body, simultaneously observes the horizon tipping up towards the celestial pole as the body culminates (rather, the arc from the horizon to the celestial poles remains constant at Ø).

The radius of the foil in the plane of the equator (the radius from the Topocentric axis to EP) is defined to be a linear function of the meridian distance of EP, namely $R_{EP} = MD_{EP} / 90$, so as EP rotates its trajectory bends in towards the Topocentric axis. Therefore the pole of EP (the angle between the Topocentric axis and the temporal line through P and EP) is given by: $\tan \text{pole} = R_{EP} \tan Ø = MD_{EP} \tan Ø /90$.

Now $MD_{EP} = RA_{EP} - RAMC$, and $RA_{EP} = OA_P$, where OA_P here means the oblique ascension of P under the given pole [$OA_P = RA_P - \text{Arcsin}(\tan D_P \tan \text{pole})$], whence

$\tan \text{pole} = (OA_P - RAMC) \tan Ø / 90$

$= (RA_P - \text{Arcsin}(\tan D_P \tan \text{pole}) - RAMC) \tan Ø / 90$

Formula VIII-7:

$\tan \text{pole} = (MD_P - \text{Arcsin}(\tan D_P \tan \text{pole})) \tan Ø / 90$

Given values for MD and declination, this equation can be solved for pole by iteration.

Example: Moon: $MD_{MO} = 16.10$, $D_{MO} = 11.23$; $\text{pole}_{MO} = 10.98$
Uranus: $MD_{UR} = 77.56$, $D_{UR} = 23.65$; $\text{pole}_{UR} = 38.58$

These values are quite close to the Topocentric poles for these bodies ($\text{pole}_{MO} = 10.97$, $\text{pole}_{UR} = 38.31$), and they are exactly the same on the equator (putting in 0 for D implies that $\tan \text{pole} = \tan Ø\ MD/90$), on the meridian (putting in 0 for pole implies that MD = 0), and on the horizon (putting in Ø for pole implies that MD = SA). However, putting Arctan (tan Ø x MD / SA) in for pole reduces Formula VIII-7 to:

$\text{Arcsin}(\tan Ø \tan D) \times MD / SA = \text{Arcsin}(\tan Ø \tan D \times MD / SA)$,

rather than to an identity. At this point, therefore the foil must be abandoned in favor of pure schematism. Figure VIII-9 shows the cone projected onto the plane of the meridian. If we represent the radius through P from the Topocentric axis to the cone as having length equal to SA_P (rather than the previously defined value of $1 + \tan D_P \tan Ø$), and if we represent the radius from the Topocentric axis to P as having length equal to MD_P (rather than $(\cot Ø + \tan D_P) \tan \text{pole}$, where pole is found from Formula VIII-7), then the symbolical angle between the schematic temporal line through P and the Topocentric axis will have a value of Arctan (tan Ø x MD / SA), which is the value of pole for which a model is being sought.

It must be pointed out that in adopting this schematic value of pole, we are no longer modelling a concept of Mundane Position, since (unlike other house systems) two distinct points which have the same pole cannot have the same Mundane Position, since two distinct points which lie on the same MD/SA locus cannotlie on the same variable ascension circle (Figure VIII-10). Thus, even if the Topocentric pole was obtained empirically (as is claimed), an adequate model which embodies this value of pole has yet to be described.

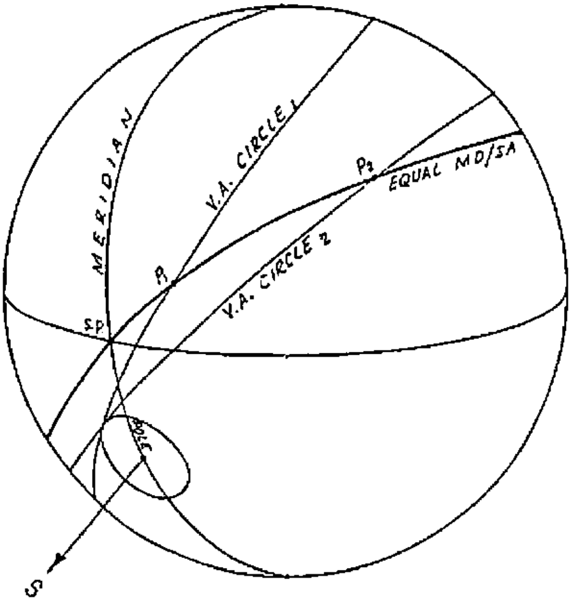


Figure VIII-10

CONCLUSION

It is not altogether clear precisely what the authors of the Topocentric system intended, i.e., what concept of Mundane Position they were seeking to model. Although the concept of a finite cone of rotation is undeniably attractive in the sense of being a better model of the astronomical reality from the point of view of the observer on earth than is the infinite geocentric sphere, ultimately the conical model runs into the same problems as the spherical model. Any moves to save opposite house cusps and the angles other than the Ascendant are necessarily moves away from the concept of equal ascension, hence undermine the raison d'etre of the system and necessitate gratuitous assumptions. The basic problem of defining Mundane Position in terms of ascension can probably only be resolved in a satisfactory manner by resettling the earth's population along the terrestrial equator, where ascension circles are hour circles.

TOPOCENTRIC SPECULUM FOR PRINCE CHARLES

	RA	DEC	MD/SA	pole	Q	W
SUN	230.01	-18.38	.32816	22.42	- 7.88	222.13
MOON	28.47	11.23	.15413	10.97	2.20	26.27
MERCURY	215.22	-12.17	.21612	15.20	- 3.36	211.86
VENUS	195.79	- 4.77	.03562	2.56	- 0.21	195.58
MARS	260.08	-24.07	.54534	34.43	-17.83	242.25
JUPITER	269.87	-23.38	.63044	38.40	-20.04	249.83
SATURN	157.63	10.92	.45729	29.89	6.37	151.26
URANUS	89.93	23.65	.62853	38.31	20.25	69.68
NEPTUNE	193.60	- 4.17	.01291	0.93	- 0.07	193.53
PLUTO	141.49	23.07	.88287	47.98	28.21	113.28
CHIRON	236.71	-16.70	.39533	26.43	- 8.58	228.13
COMET	187.69	-26.52	.03632	2.61	- 1.31	188.99
NODE	32.68	13.18	.18958	13.41	3.20	29.48
ASC	127.86	18.90	1.	51.50	25.49	102.37
MC	12.37	5.30	0.	0.	0.	12.37

CHAPTER IX: OTHER METHODS

DR. JONES' METHOD

Dr. Marc Edmund Jones advocated a method of primary directing which is essentially the same as mundane aspectual directions in the Meridian system, i.e., the arc of direction is obtained by subtracting the RA of the aspect point to the significator from the RA of the promissor; however arcs are equated to time in the following fashion:

The "diurnal semi-arc" of the promissor is computed by substituting the RA of the promissor for the RAMC in Formula A8 (Ascendant), converting the resulting longitude to RA via Formula A2, and subtracting the RA of the promissor from it. The "operative semi-arc" of the promissor is its "DSA" if it lies in the 2nd or 4th Quadrants, and 180 - "DSA" if it lies in the 1st or 3rd Quadrants. One ninetieth of the promissor's "operative semi-arc" is its yearly increment in RA.

Example: MO TRI SA Jones c: RA_{SA} = 157.63; Aspect = -120; hence RA_{Ap} = 37.63; RA_{MO} = 28.47, hence Arc = -9.16. By Formula A8, when RAMC = 28.47, the longitude of the Ascendant is 136.84, and by Formula A2, the RA corresponding to this longitude is 139.29; hence "DSA_{MO}" = 110.82 and since the moon lies in the 4th Quadrant, this is its operative "SA"; hence the yearly travel of the moon = 1.231, so the arc of direction operates in 7.439 years = 23 April 1956.

ARCS IN LONGITUDE

All of the methods considered thus far measure planetary motion in terms of right ascension, i.e., in one fashion or another they model the diurnal rotation of the earth. There are other classes of directions in common usage, however, which are based upon planetary motion measured in longitude. Thus these directions cannot strictly be classed as primary directions, but on the other hand they are not models of actual zodiacal motion either (as are secondary progressions and transits). In these systems the arc of direction is the difference in longitude between the promissor and an aspect point to the significator (e.g., the arc of direction of MO TRI SA c is 30.44 - 35.27 = -4.83). Where these methods of direction differ among themselves is in how they equate arcs of direction to time.

SYMBOLIC DIRECTIONS

In a symbolic (or radix) direction, the promissor is moved in longitude at a fixed yearly rate, of which .9856 (= 360/365.25) degrees, one degree, and 4.286 (= 30/7) degrees are the most popular yearly increments; however, there are also advocates of the increments .1429 (= 1/7), .2083 (= 30/144), .2422 (= days in a tropical year - 365), .25, .2564 (= days in a sidereal year - 365), .5714 (= 4/7), .6 (=3/5), 2.5 (= 30/12), 3.3333 (= 30/9), 13.167 (= average daily motion of moon), and in fact any rational fraction (Carter).

In a symbolic direction, the arc of direction is divided by the fixed increment to obtain the number of years (and fractions) from birth until the direction operates.

Example: MO TRI SA c: Arc = -4.83;

.9856 measure yields 4.901 years = 9 October 1953
1 degree measure yields 4.83 years = 13 September 1953
4.286 measure yields 1.127 years = 30 December 1949

The Aries point (also called the Point of Life) is often used as a promissor in symbolic directions, and the author can attest that in the one degree per year measure at least the Point of Life is a powerful promissor whose conjunctions and oppositions produce significant events of a dissociative nature within an orb of a month.

In symbolic directions, the arc of direction of a promissor P directed to mundane parallel with significator S is given by:

Arc = $L_P - 2 \times L_M + L_S$, where L_P is the longitude of P, L_S is the longitude of S, and L_M is the longitude of the meridian nearest S (MC or IC). The arc of direction of a promissor P directed to mundane contraparallel with significator S is given by:

Arc = $L_P - 2 \times L_M + L_S \pm 180$.

The arc of direction of promissors X and Y directed to symbolic rapt parallel with significator Z (X/Y = Z) is given by:

Arc = $(L_X + L_Y) / 2 - L_Z$.

SOLAR ARC IN LONGITUDE

In a solar arc direction, the promissor is moved in longitude at the same rate as the secondary progressed sun. The absolute value of the arc of direction is added to the sun's natal longitude (not subtracting 360 if the sum should exceed 360), and this sum is used for PL in Step 3 and the following steps of the True Solar Arc in RA algorithm, using the absolute value of the arc of direction for A in Step 4.

Example: MO TRI SA S.A. c: Arc = -4.83; PL = 237.25; L = 17517.25; initial T = .4888491; successive iterations:

Z	T
17596.57919	.47884800
17596.54928	.47884802

DY = 4.781; PY = 1953.653 = 26 August 1953

ASCENDANT AND VERTICAL ARCS IN LONGITUDE

The arc of direction in longitude may also be considered to be a measure between two Ascendant or Vertex positions, in analogy with the Ascendant and Vertical arcs in RA. Here the arc of direction (in longitude) is added to the natal Ascendant (or Vertex) to obtain the directed Ascendant (or Vertex). The directed MC (or IC) is then obtained from a table of houses for the latitude (or colatitude) of the birthplace, or by direct calculation from the OA of the Ascendant (or OD_2 of the Vertex), and the difference between this directed MC (or IC) and the natal MC (or IC) is added to the sun's natal longitude to obtain PL, which is used in the True Solar Arc in RA algorithm (using the difference between the directed and natal MC's for A).

ARCS IN DECLINATION

It has been suggested (Jayne I) that arcs of direction be measured in declination (to parallels and contraparallels of the significator) as well as RA and longitude. In a solar declination arc, the difference in declination between the promissor and significator is added to the declination of the natal sun; the sum is converted to longitude by:

$L = \text{Arcsin} (\sin D \,/\, \sin E)$,

and this value of L is used for PL in Step 3 and the following steps of the True Solar Arc in RA algorithm (using the difference between L and the longitude of the natal sun for A). In other words, the solar declination arc is timed by the motion in declination of the secondary progressed sun.

The calculations for the solar declination arc are complicated by the fact that motion in declination reverses near the Cancer and Capricorn points, and allowance must be made for this.

SOLAR ARC IN DECLINATION ALGORITHM

1. If the absolute value of the promissor's declination is increasing at birth (promissor is moving away from the equator) such that the promissor will reach its point of maximum declination (when it is near, but not usually equal, in longitude to 90 or 270) before it reaches the parallel or contraparallel to the significator, then the arc of direction is given by:

$\text{Arc} = |D_{MAX} - D_P| + |D_{MAX} - D_S|$

where D_P and D_S are the declinations of the promissor and significator, and D_{MAX} is the maximum declination of the promissor (from the ephemeris; however, D_{MAX} is never permitted to exceed E even if D_P or D_S should exceed E. The direction is considered impossible if $|D_S| > |D_P| > E$).

Otherwise, the arc of direction is given by:

$\text{Arc} = |D_P - D_S|$

2. Let L_{SU} be the longitude of the natal sun.
If $90 \leq L_{SU} < 270$ then let $D' = D_{SU} - \text{Arc}$; otherwise, let

$D' = D_{SU} + \text{Arc}$, where D_{SU} is the declination of the natal sun.

3. If $|D'| > E$ then
   If $D' > 0$ then let $L = 180 - \text{Arcsin}(\sin(2E - D') / \sin E)$
   If $D' < 0$ then let $L = 360 - \text{Arcsin}(\sin(2E + D') / \sin E)$

4. If $|D'| \leq E$ then let $X = \text{Arcsin}(\sin D' / \sin E)$
   If $0 \leq L_{SU} < 90$ then $L = X$
   If $90 \leq L_{SU} < 270$ then $L = 180 - X$
   If $270 \leq L_{SU} < 360$ then $L = 360 + X$

(if $L > 360$ do not subtract 360 from it). Use this value of L for PL in Step 3 and the following steps of the True Solar Arc in RA algorithm (using $L - L_{SU}$ for A in Step 4).
Example: MA ⧺ PL: $D_{MA} = -24.07$; $D_{PL} = 23.07$; Arc = 1.00; $D_{SU} = -18.38$, so $D' = -19.38$; $X = -56.51$; $L = 236.51$; going into Step 3 of the True Solar Arc in RA algorithm with PL = 236.51 and A = 4.09, L = 17516.51; initial T = .4888289; final T = .4788280; DY = 4.048; PY = 1952.919 = 1 December 1952

ASCENDANT AND VERTICAL ARCS IN DECLINATION

The arc of direction in declination may also be considered to be measured between two Ascendant or Vertex positions. Jayne (I) describes two variants on the calculations: in the first the directed Ascendant (or Vertex) is moved at the same rate in declination as the progressed sun; in the second the directed Ascendant (or Vertex) is moved at the same rate in declination as the progressed sun would move were it at the longitude of the directed Ascendant (or Vertex).

In the first method the arc of direction in declination between the promissor and significator is computed in the usual way (Step 1 of the Solar Arc in Declination algorithm), but in Step 2 the longitude and declination of the natal Ascendant (or Vertex) should be substituted for the longitude and declination of the natal sun. Step 3 (if applicable) is the same; but in Step 4 the longitude of the natal Ascendant (or Vertex) is substituted for L_{SU}; and if L exceeds 360, then 360 should now be subtracted from it. The MC (or IC) corresponding to an Ascendant (or Vertex) with this longitude L is obtained from a table of houses for the latitude (or colatitude) of the birthplace, or else calculated from the OA of the Ascendant (or OD_2 of the Vertex). The natal MC (or IC) is subtracted from this directed MC (or IC), and the difference is added to the longitude of the natal sun to obtain PL for Step 3 of the True Solar Arc in RA algorithm (and the difference in longitudes between the directed and natal MC's (or IC's) is used for A).

The second method is the same as the first through the calculation for L, the longitude of the directed Ascendant (or Vertex). It is this value of L that is used for PL in Step 3 of the True Solar Arc in RA algorithm (together with $A = L - L_{ASC}$, where L_{ASC} is the longitude of the natal Ascendant or Vertex). However, the Julian Date must be recalculated using the date and GMT when the sun next is at the longitude of the natal Ascendant (or Vertex). The DY so obtained is added to the year (and fraction) of birth to obtain the year (and fraction) when the direction operates.

ARCS IN LONGITUDE AND DECLINATION

Jayne (I) has also suggested that arcs of direction in longitude be interpreted in terms of declination. Once the arc of direction in longitude (the difference in longitude between the promissor and significator) has been obtained, the arc of direction is added to the natal MC, ASC, or VTX to obtain a directed MC, ASC, or VTX. In the case of the ASC (and VTX) arcs, the MC (or IC) corresponding to this directed ASC (or VTX) must be calculated from a table of houses for the latitude (or colatitude) of the birthplace, or calculated directly from the OA (or OD_2) of the directed Ascendant (or Vertex).

Then the difference between the declinations of the directed and natal MC's (or IC's) yields a declination arc which can be equated to time using either of the methods in the preceding section; i.e., by either the solar arc in declination (Step 2 ff. of the Solar Arc in Declination algorithm) or by the solar arc in declination if the sun were at the MC (replace L_{SU} and D_{SU} in Step 2 with L_{MC} and D_{MC}, and enter Step 3 of the True Solar Arc in RA algorithm with L for PL, the difference in longitudes of the directed and natal MC's for A, and the Julian Date calculated for the moment the sun next reaches the longitude of the natal MC. The resulting DY is added to the year and decimal fraction of birth to obtain the time the direction will operate).

CHAPTER X: THE ARABIAN PARTS

An Arabian part is an artificial point on the celestial sphere whose position is calculated from the formula A + B - C, where A, B, and C are the positions (usually longitudes) of planets, angles, or house cusps of a natal horoscope. Most of the Arabian parts which have been given special names are of the form: $P_{part} = P_{1st\ cusp} + P_{planet\ B} - P_{planet\ C}$, where P is the position (usually longitude) of the subscripted body. In the following discussion reference will be made only to the Part of Fortune ($P_{POF} = P_{1st\ cusp} + P_{MOON} - P_{SUN}$), but the methods used can easily be adapted to compute any Arabian part of the form $P_{1st\ cusp} + P_B - P_C$.

The Part of Fortune has historically been calculated in a variety of ways, for example:

Formula X-1: $L_{POF} = L_{ASC} + L_{MO} - L_{SU}$
$B_{POF} = 0$

where L is the longitude of the subscripted body and B_{POF} is the celestial latitude of the Part of Fortune. This is far and away the most common method (Ptolemy, De Luce, Sepharial, et al.).

Formula X-2: $RA_{POF} = RA_{ASC} + RA_{MO} - RA_{SU}$
$D_{POF} = 0$

where RA is the RA of the subscripted body and D_{POF} is the declination of the Part of Fortune (Noonan).

Formula X-3: $RA_{POF} = OA_{ASC} + RA_{MO} - OA_{SU}$
$D_{POF} = D_{MO}$

where OA is the OA of the subscripted body (Placidus, Jayne (II), et al.).

Formula X-4: $RA_{POF} = OA_{ASC} + W_{MO} - W_{SU}$
$D_{POF} = 0$

where W is computed using the incorrect Placidus method of Chapter VII (Simmonite).

There exists a variety of opinions on how the Part of Fortune should be calculated because there is no single, generally-agreed upon concept of what the Part of Fortune is or represents, nor of how such a concept should be modelled mathematically. There are two main schools of thought on the subject:

The first school views the Part of Fortune as the house position of the moon at sunrise.

The second school views the Part of Fortune as the phase of the moon measured in terms of house position. However, none of the Formulas X-1 through X-4 is an accurate model of either one of these concepts.

In the first case, if the Part of Fortune is construed as the lunar position at dawn on the birthday, then it would seem logical that the positions of the Ascendant, sun, and moon that obtained at the moment of sunrise on the day of birth be used in the formula rather than the positions at the moment of birth. However, this point will be left moot; the following exposition will concern itself entirely with the second of the two concepts mentioned above.

If the Part of Fortune is to be considered a representation of the moon's phase measured in terms of house position, then at the very least it should be required that:

A. POF is conjunct the 1st house cusp when the moon is new
B. POF is conjunct the 4th house cusp at first quarter
C. POF is conjunct the 7th house cusp at full moon
D. POF is conjunct the 10th house cusp at last quarter.

Formula X-1 always obeys conditions A and C but not B or D, except fortuitously. Since lunar phase is essentially a function of longitude, Formulas X-2 through X-4 cannot be considered accurate models of the astronomical situation*.

In addition to conditions A through D above, it might be thought expedient to require that

E. POF is conjunct an intermediate house cusp when the arc from sun to moon is a multiple of 30 (POF conjunct 2nd cusp when $L_{MO} - L_{SU} = 30$; POF conjunct 3rd cusp when $L_{MO} - L_{SU} = 60$; etc.).

Granite defines the Part of Fortune in this way and gives an algorithm for computing its approximate longitude based on linear interpolation between succeeding house cusps. However, the most logical way of defining the Part of Fortune so as to conform to conditions A through E above is in terms of Mundane Position, viz.:

Formula X-5: $MP_{POF} = MP_{1st\ cusp} + L_{MO} - L_{SU}$
where MP is the numerical Mundane Position (in any given house system).

If the Part of Fortune is only permitted to serve as significator (and some authors, such as Simmonite, forbid the use of the Part of Fortune as promissor), then this is all the information about the Part of Fortune that is required to calculate primary directions to it. However, if the Part of Fortune is to serve as the promissor in a primary direction as well, further definition is required since there are an infinite number of points which satisfy Formula X-5 for any given value of $L_{MO} - L_{SU}$. In the calculations which follow, the ecliptic point whose numerical Mundane Position equals $MP_{ASC} + L_{MO} - L_{SU}$ will be chosen to serve as the canonical Part of Fortune for the purpose of calculating primary directions. This is in keeping with popular tradition, that the Part of Fortune should be a point in the zodiac. It must be noted, however, that good cases can be made as well for the points lying on the celestial equator, the moon's diurnal circle, the moon's celestial latitude circle, or the moon's orbital plane, whose Mundane Positions satisfy Formula X-5, as being the most apt representatives of the Part of Fortune for the purpose of calculating primary directions.

Since every house system is based upon a different concept of Mundane Position, evidentally every house system will have a unique Part of Fortune. In essence the calculations for the Part of Fortune in a given house system are the same as those for the

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*To be strictly accurate, the actual angle between the sun and moon should be used in place of the difference in their longitudes, but this seems an unnecessary complication. The actual angle between the sun and moon is given by:
$\text{Arccos } (\cos B_{MO} \cos(L_{MO} - L_{SU}))$

house cusps. Three examples (Campanus, Regiomontanus, and Placidus) will suffice to show what is involved.

THE CAMPANUS PART OF FORTUNE

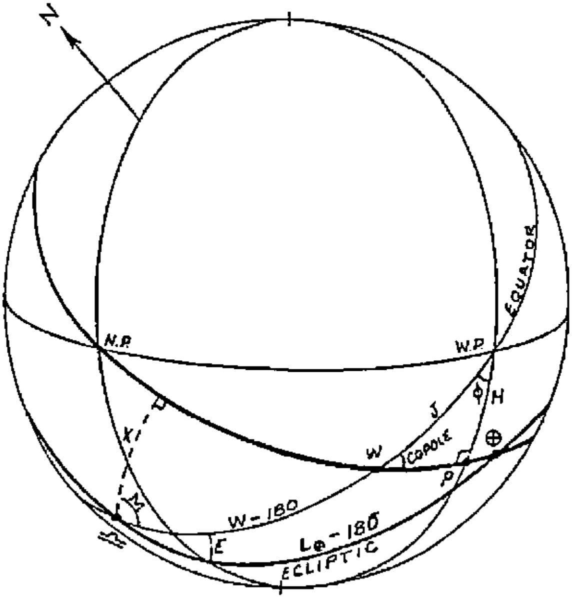

Figure X-1

The Campanus Part of Fortune is found by laying off the longitudinal arc between the sun and moon along the prime vertical from the East point in the direction of the nadir. In Figure X-1, the value of this arc lies between 90 and 180, so the terminus of the arc (the point P) and hence the Part of Fortune (the intersection of the ecliptic and the house circle through P) both lie in the 2nd Quadrant.

Let Arc = $L_{MO} - L_{SU}$

Let H = 180 - Arc, i.e., H is the arc measured along the prime vertical from the West point to P. Let W be the point of intersection of the equator with the house circle through P; W will also mean the RA of this point. Let J be the arc measured along the equator from the West point to W. Let copole be the angle between the equator and the house circle through P.

Consider the triangle whose sides are arcs of the equator (= J), the prime vertical (= H), and the house circle through P. The angle between the equator and prime vertical equals ϕ, and the other angle equals copole. Hence

By Rule 7, $J = \text{Arctan}(\tan H / \cos \phi)$

By Rule 4, $\text{pole} = \text{Arcsin}(\cos H \sin \phi)$

Since the RA of W equals the RA of the West point minus J,

W = RAMC - 90 - J.

Now drop a perpendicular from the Libra point to the house circle through P. Let M be the angle between this perpendicular and the equator, and let X be the arc measure of the perpendicular.

Consider the triangle whose sides are arcs of the equator (= W - 180), the perpendicular (= X), and the house circle through P. The angle between the equator and the perpendicular equals M, and the other angle (between the equator and house circle) equals copole.

By Rule 6, $M = \text{Arctan}\ (-\tan \text{pole} / \cos W)$
By Rule 7, $\tan X = \cos M \tan W$

Consider the triangle whose sides are arcs of the ecliptic (= $L_{POF} - 180$), the perpendicular (= X), and the house circle through P. By Rule 7, $\cos (M + E) = \tan X \cot (L_{POF} - 180)$, whence $L_{POF} = 180 + \text{Arctan}\ (\cos M \tan W / \cos (M + E))$.

The general algorithm for computing the longitude of the Campanus Part of Fortune is as follows:

```
1.  Let $\text{Arc} = L_{MO} - L_{SU}$

2.  If Arc = 0, 90, 180, or 270 then
        $L_{POF}$ = ASC, IC, DESC, or MC, respectively.

3.  If Arc < 90 then let H = Arc
    If 90 < Arc < 180 then let H = 180 - Arc
    If 180 < Arc < 270 then let H = Arc - 180
    If 270 < Arc < 360 then let H = 360 - Arc

4.  Let $J = \text{Arctan}\ (\tan H / \cos Ø)$
    Let $\text{pole} = \text{Arcsin}\ (\cos H \sin Ø)$

5.  If Arc < 90 then let W = RAMC + 90 + J
    If 90 < Arc < 180 then let W = RAMC - 90 - J
    If 180 < Arc < 270 then let W = RAMC - 90 + J
    If 270 < Arc < 360 then let W = RAMC + 90 - J

6.  Define the 1st segment to be the intervals from 0 to 90 and
    from 270 to 360.
    Define the 2nd segment to be the interval from 90 to 270.

    If W = 90 then let $R = \text{Arctan}\ (\sin E \tan \text{pole})$ and
        If Arc lies in the 1st segment then $L_{POF} = 90 + R$
        If Arc lies in the 2nd segment then $L_{POF} = 90 - R$
    If W = 270 then let $R = \text{Arctan}\ (\sin E \tan \text{pole})$ and
        If Arc lies in the 1st segment then $L_{POF} = 270 - R$
        If Arc lies in the 2nd segment then $L_{POF} = 270 + R$

7.  Let $M = \text{Arctan}\ |\tan \text{pole} / \cos W|$

8.  If Arc and W lie in the same segment then let Z = M + E
    If Arc and W lie in different segments then let Z = M - E

9.  If Z = 90 then
        If W < 180 then $L_{POF} = 90$
        If W > 180 then $L_{POF} = 270$
    If Z > 90 then the value of $L_{POF}$ obtained in Step 11 below
    will fall away from Cancer (if W < 180) or Capricorn (if W > 180)
    in the opposite direction from that computed in Step 11.

10. Let $R = \text{Arctan}\ |\cos M \tan W / \cos Z|$
```

11. If $W < 90$ then $L_{POF} = R$
If $90 < W < 180$ then $L_{POF} = 180 - R$
If $180 < W < 270$ then $L_{POF} = 180 + R$
If $270 < W < 360$ then $L_{POF} = 360 - R$.

If $\emptyset < 0$, use $-\emptyset$ in the formula, substitute RAIC for RAMC, and add 180 to L_{POF} at the end.
Example: $L_{MO} = 30.44$; $L_{SU} = 232.42$; Arc = 158.01; H = 21.99; J = 32.97; pole = 46.53; W = 249.40; M = 71.55; Z = 95.00; R = 84.09; L = 264.09; however, per Step 9 above, since $Z > 90$ then L_{POF} must fall the other way from 270, i.e., L_{POF} = 270 - 264.09 + 270 = 275.91 = 5 CP 55.

The value of L_{POF} obtained from the foregoing algorithm obeys conditions A through E given earlier in this chapter and hence may be considered the only astronomically valid Campanus Part of Fortune. It is evident, however, that the authors of Formulas X-2 through X-4 had a mundane (rather than zodiacal) definition of the Part of Fortune in mind, and the above algorithm can be adapted to such a definition by substituting CMP_{MO} - CMP_{SU} for Arc, where CMP is the Campanus numerical Mundane Position. However, this definition represents a move away from the concept of the moon's phase measured in the houses, and thus seems an unnecessary complication.

THE REGIOMONTANUS PART OF FORTUNE

The Regiomontanus Part of Fortune is found by laying off the longitudinal arc between the sun and moon along the equator from the East point in the direction of the RAIC. As Figure X-1 indicates, the situation is the same as in Campanus but here J is the given quantity (J = 180 - Arc in this case) and H is calculated from it. By Rule 7, H = Arctan (tan J cos $\emptyset$).

The general algorithm for computing the Regiomontanus Part of Fortune is:

1. Let Arc = $L_{MO} - L_{SU}$

2. If Arc = 0, 90, 180, or 270 then
L_{POF} = ASC, IC, DESC, or MC, respectively.

3. If Arc < 90 then let J = Arc
If 90 < Arc < 180 then let J = 180 - Arc
If 180 < Arc < 270 then let J = Arc - 180
If 270 < Arc < 360 then let J = 360 - Arc

4. Let H = Arctan (tan J cos $\emptyset$)

Then compute pole, W, M, Z, R, and L_{POF} as for the Campanus Part of Fortune. If $\emptyset < 0$ then use $-\emptyset$ for $\emptyset$, substitute RAIC for RAMC, and add 180 to L_{POF} at the end.

Example: $L_{MO} = 30.44$; $L_{SU} = 232.42$; Arc = 158.01; J = 21.99; H = 14.11; pole = 49.38; W = 260.38; M = 81.84; Z = 105.29; R = 72.52; $L_{POF} = 252.52$; however, since Z > 90 then L_{POF} must fall the other way from 270, i.e., $L_{POF} = 270 - 252.52 + 270 = 287.48$ = 17 CP 29.

If a mundane (rather than zodiacal) definition of the Regiomontanus Part of Fortune is desired, $W_{MO} - W_{SU}$ may be substituted for Arc, where W is the oblique ascension under own pole from the Campanus-Regiomontanus speculum.

THE PLACIDUS PART OF FORTUNE

The Placidus Part of Fortune is that point on the ecliptic whose Placidus Mundane Position is equal to the arc in longitude from the sun to the moon. Consider the case of 90 < Arc < 180, i.e., where the Part of Fortune lies in the 2nd Quadrant. Then by the formula for Placidus Mundane Position,

$\text{Arc} = 90 + 90 \times MD_{POF} / SA_{POF}$, whence

$MD_{POF} = (\text{Arc} - 90) \times SA_{POF} / 90$. Since the Part of Fortune lies in the 2nd Quadrant, the nocturnal semi-arc is used; also $MD_{POF} = RA_{POF} - RAIC$, hence:

$RA_{POF} - RAIC = (\text{Arc} - 90)\ \text{Arccos}\ (\tan D_{POF} \tan \emptyset) / 90$.

Since the Part of Fortune lies on the ecliptic, $\tan D_{POF} = \sin RA_{POF} \tan E$, therefore

$RA_{POF} = RAIC + (\text{Arc} - 90)\ \text{Arccos}\ (\sin RA_{POF} \tan E \tan \emptyset) / 90$

Starting with an initial value of $RA_{POF} = RAIC + \text{Arc} - 90$ on the right side of the equation, recycle the value of RA_{POF} obtained on the left side until successive iterations are sufficiently constant. The value thus obtained for RA_{POF} is then converted to longitude using Formula A3.

Example: Arc = 158.01, E = 23.4459; RAIC = 192.37; $\emptyset = 51.5$; successive iterations: 260.38, 284.96, 284.40, 284.47, 284.46; and by Formula A3, $L_{POF} = 283.31$ = 13 CP 18.

The general algorithm for computing the Placidus Part of Fortune is as follows:

1. Let $\text{Arc} = L_{MO} - L_{SU}$.

2. If Arc$\leq$180 then let R = RAIC, let K = (Arc - 90)/ 90,
   let T = 1 and let initial $RA_{POF} = RAIC + \text{Arc} - 90$
   If 180 < Arc then let R = RAMC, let K = (Arc - 270) / 90,
   let T = -1 and let initial $RA_{POF} = RAMC + \text{Arc} - 270$

3. $RA_{POF} = R + K\ \text{Arccos}\ (T \sin RA_{POF} \tan E \tan \emptyset)$

   Use the initial value of RA_{POF} on the right side to obtain a new value of RA_{POF} on the left side, and recycyle until successive iterations are sufficiently constant.

4. Convert RA_{POF} to L_{POF} with Formula A3.

If a mundane (rather than zodiacal) definition of the Placidus Part of Fortune is desired, substitute $PMP_{MO} - PMP_{SU}$ for Arc, where PMP is the Placidus Mundane Position (from the Placidus speculum).

CHAPTER XI: THE FIXED STARS

The fixed stars are effective promissors in primary directions to angles equated to time with the True Solar Arc in RA. The effect of a typical fixed star conjunct an angle colors conditions in the life for several weeks before and after it is exact.

Much work remains to be done on interpreting the effects of the individual fixed stars, but preliminary investigation suggests the following guidelines:

1. As with the planets, there is no noticeable difference between converse and direct directions; i.e., both are equally effective.
2. There is not much noticeable difference between the various angles used as significators, except that directions to the Descendant do tend to work out through close relationships.
3. There is no obvious correlation between beneficence / maleficence and color (spectral class). In a general sort of way, brighter stars do tend to be of stronger influence. As is the case also with the planets, malefic stars tend to produce more conspicuous events merely because they are malefic.
4. In a general way, fixed stars are more impersonal in their influence than are planets. Both planets and fixed stars directed to angles often produce events in the world outside the native; however in the case of the planetary promissor it is usually quite clear that the native's own mental state (symbolized by the planet) has called that event to him. His own psychological impulse conjures up an appropriate circumstance.

By contrast, stellar promissors produce events which concern the impingement upon the native of the plans and actions of others, his being assisted or jostled by his environment. That is to say, situations with which he must deal that are not primarily of his own authorship. This is a more passive mode of activity than that symbolized by the planets, under whose influence the native is himself the prime mover or actor. The stars reveal the native in his social persona, whether this be identified as bondage (in the case of malefic stars) or opportunity (in the case of the benefics). It is his impersonal role as a family member, a member of his profession, community, etc. that is highlighted by a stellar direction.

INTERPRETATION OF FIXED STARS

The Table of Suggested Interpretations lists 41 stars (all stars brighter than magnitude 2.0, together with Alcyone and Polaris). The stars are given a "strength rating" of ±1 to ±3. A benefic star is indicated by a "+"; a malefic star is indicated by a "-". A star which is variable in influence is indicated by a "±".

The question of precisely what is meant by the term "strength" is a vexing one which deserves a book of its own; however for present purposes it will suffice that a star is considered to be strong if the events which it produces by direction are significant, and if the different events which it produces in different horoscopes are consistent, i.e., tend to run to a clearly defined type. A strength rating of 1 indicates a star about as weak as any star on the list, and a strength rating of 3 indicates a star about as strong as any star on the list. One might say that the strength rating is an index of how well the given interpretation may be expected to work in a given case. Needless to say, this is a highly subjective categorization which awaits much further refinement.

STAR TABLES

The Table of Fixed Stars for Epoch 1 January 1950 lists 137 stars (all stars brighter than magnitude 3.0), in order of increasing right ascension.

Number - The first column gives the star's number in the present catalogue. The later tables of longitudes and OA/OD refer to the stars by this number. The number appears with an asterisk if the star is one of the 41 stars listed in the Table of Suggested Interpretations.

NAME - Star names are congruent with those given by Robson. Names of stars not listed by Robson are taken from Allen. Where a name is not given, it is unknown.

BAYER - The third column lists the Bayer designation, a Greek letterfollowed by the abbreviation for the constellation. In lieu of Greek letters, the following alphabet is used:
abgdezhciklmnqoprstuvxyw

MAG - The fourth column lists the star's magnitude.

RA - The fifth column gives the star's right ascension for 1 January 1950, in degrees and decimals.

AVRA .- The sixth column gives the star's annual variation in right ascension, in hundredths of a degree. To find the RA of a star for a given date, multiply the star's AVRA / 100 by the number of years between 1 January 1950 and the given date (- if before 1950 and + if after). Add the product to the star's RA in column five. Note that interpolation for Polaris is inaccurate. Use the Polaris table on the next page.

DEC - The seventh column gives the star's declination for 1 January 1950, in degrees and decimals.

AVDEC - The eighth column gives the star's annual variation in declination, in hundredths of a degree. If AVDEC > 0, the star is moving north with time; if AVDEC < 0, the star is moving south with time. To find the declination of a star for a given date, multiply the star's AVDEC / 100 by the number of years between 1 January 1950 and the given date (- if before 1950 and + if after). Add the product to the star's declination in column seven. Example: RA and declination of Cor Caroli for 14 November 1948 = 1948.872 which is 1.1 years before 1 January 1950.

AVRA = 1.17 x -1.1/100 = -.01, hence RA = 193.42 -.01 = 193.41
AVDEC = -.54 x -1.1/100 = .01, hence DEC = 38.59 +.01 = 38.60

TABLE OF LONGITUDES

The Table of Longitudes lists the stars in order of increasing longitude in degrees - sign - minutes notation. Next to each longitude is given the number of the star which holds that longitude. If the star number appears with an asterisk, then the star is one of the 41 stars listed in the Table of Suggested Interpretations. This table can be corrected to any given date by multiplying .014 degrees by the number of years between 1 January 1950 and the given date (+ if before 1950 and - if after). Convert to degrees and minutes and subtract the product from the star's longitude to obtain the longitude for the given date.

TABLES OF OBLIQUE ASCENSION AND DESCENSION

Tables of oblique ascension and descension are given for every five degrees of terrestrial latitude to 65 degrees north. The tables will also serve for corresponding southern latitudes, but then the ascensions should be read as descensions and vice versa. The stars are listed in each table in order of increasing oblique ascension (or descension) to the nearest degree*. Next to each value of OA and OD is given the number of the star which has this OA or OD at the given latitude. If the star number appears with an asterisk, then the star is one of the 41 stars listed in the Table of Suggested Interpretations.

POLARIS

For dates in the twentieth century, let $X = (\text{YEAR} - 1900)/20$.

$$RA = 20.542 + 2.248\,X + .089\,X^2 + .031\,X^3$$

$$Dec = 88.774 + .104\,X - .001\,X^2$$

Example: Year = 1948.87; X = 2.44; RA = 27.02; Dec = 89.03

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*The OA / OD tables are not intended to serve as an aid to computation, but merely to indicate which stars lie in a given range.

TABLE OF SUGGESTED INTERPRETATIONS

Achernar	-2	Difficult adjustments; emotional pressure; jealousy
Acrux	+3	Fulfillment; wish come true; acceptance and approval
Adhara	±2	Excitement; feverish activity; intense confrontations
Agena	+1	New direction; release from pressure and uncertainty
Alcyone	±1	Doubts, insecurity; reflection on where one is heading; need to take control of life
Aldebaran	-2	Helplessness; oppression; circumstances beyond control
Alhena	+1	Greater scope or responsibility; proving one's mettle
Alioth	-1	Imposition; alienation; misunderstanding
Alnilam	±1	Change of environment; relationships primary concern
Alphatra	-1	Pressure; imposition; worries and insecurity
Altair	+1	Escape from rut; new interests, outlook, hope
Antares	+2	"Coming home"; finding one's niche, where one belongs
Arcturus	+3	Ambition; self respect; new opportunities, friendships
Avior	+1	Complete break with past; confidence; inspiration
Bellatrix	+1	Struggle to break free of outside control; new beginning after difficult period; enthusiasm
Benetnash	+1	Shift in frame of reference; establishing relationships
Betelgeuze	+1	Shed illusions, face reality; pause for reflection
Bungula	±1	Search for more congenial environment; move or journey
Canopus	-3	Limitation, restriction; heavy emotional pressure; imposed on by others; sense of aloneness
Capella	-1	Emotional turmoil; sticky entanglements with others
Castor	+2	Impasse resolved or bypassed; new interests, hope
Deneb	±1	After frustrating period, decision is made to change course, embark on new ventures, relationships
Dubhe	+1	Abrupt shift in perspective; finding oneself
El Nath	+1	Need for union; help received from others
Fomalhaut	+1	Out of rut; move or career change; responsibility
Gacrux	+1	Adventure, excitement; generally enthusiastic but with disquieting intimations
Kaus Aust	-2	Conflicts or separations; nervousness or depression
Miaplacidus	+1	An ego boost; being one's own person; doing one's own thing
Mimosa	±1	Need to triumph over adversity; stand up for self
Mirfak	-2	Inner strength under difficult pressure; decisive step in the face of uncertainty
Mirzam	-2	Anxiety, tension, frustration; sense of non-fulfillment; lonely, depressing, irritating
Polaris	+1	End of difficult period; new hope and enthusiasm
Pollux	+1	New worlds to conquer; new perspectives, responsibilities; coming into one's own
Procyon	±1	Intense, emotional; things come to a head; call for hard work, dedicated effort
Regulus	+3	Power, prowess, exuberance; take control of one's life
Rigel	+1	Enthusiasm; birth of new skills and interests
Shaula	±1	Need to take charge, get on top of situation; opportunity to develop new skill or aptitude
Sirius	+2	Turning a new leaf; starting new life or career
Spica	-3	Heavy pressure; difficulties with others; deception, underhandedness; strange, worrisome undercurrents
Vega	+1	Freedom, independence; take control of own affairs
Wezen	±1	Come out of depression; chance to begin anew

TABLE OF FIXED STARS EPOCH 1 JANUARY 1950

#	NAME	BAYER	MAG	RA	AVRA	DEC	AVDEC
1	ALPHERATZ	a And	2.15	1.45	1.29	28.81	.55
2	CAPH	b Cas	2.42	1.62	1.33	58.87	.55
3		b Hyd	2.90	5.79	1.31	-77.54	.56
4	ANKAA	a Phe	2.44	5.95	1.23	-42.58	.54
5	SHEDAR	a Cas	2.31	9.41	1.42	56.26	.55
6	DIFDA	b Cet	2.24	10.27	1.25	-18.26	.55
7	TSIH	g Cas	2.25	13.42	1.51	60.45	.54
8	MIRACH	b And	2.37	16.73	1.40	35.36	.53
9	RUCKBAH	d Cas	2.80	20.63	1.64	59.98	.52
10*	ACHERNAR	a Eri	.61	23.96	.93	-57.49	.51
11*	POLARIS	a UMi	2.12	27.02		89.03	
12	SHARATAN	b Ari	2.72	27.97	1.38	20.56	.49
13	ALMACH	g Cas	2.28	30.20	1.53	42.09	.48
14	HAMAL	a Ari	2.23	31.09	1.41	23.23	.47
15	MENKAR	a Cet	2.82	44.92	1.31	3.89	.39
16	ALGOL	b Per	2.80	46.23	1.63	40.76	.39
17*	MIRFAK	a Per	1.90	50.19	1.79	49.68	.36
18*	ALCYONE	h Tau	2.96	56.13	1.49	23.95	.31
19		z Per	2.91	57.75	1.57	31.74	.30
20	KEUEN SHE	e Per	2.96	58.62	1.68	39.87	.29
21*	ALDEBARAN	a Tau	1.06	68.26	1.43	16.41	.20
22	CURSA	b Eri	2.92	76.35	1.23	-5.15	.13
23*	RIGEL	b Ori	.34	78.03	1.20	-8.26	.12
24*	CAPELLA	a Aur	.21	78.25	1.85	45.95	.10
25*	BELLATRIX	g Ori	1.70	80.61	1.34	6.31	.09
26*	EL NATH	b Tau	1.78	80.78	1.58	28.57	.08
27	MINTAKA	d Ori	2.48	82.36	1.28	-.33	.07
28	ARNEB	a Lep	2.69	82.63	1.10	-17.86	.07
29	ENSIS	c Ori	2.87	83.25	1.23	-5.94	.07
30*	ALNILAM	e Ori	1.75	83.42	1.27	-1.23	.06
31	PHACT	a Col	2.75	84.46	.90	-34.10	.05
32	ALNITAK	z Ori	2.05	84.56	1.26	-1.97	.05
33	SAIPH	k Ori	2.20	86.35	1.19	-9.69	.04
34*	BETELGEUZE	a Ori	.92	88.12	1.35	7.40	.02
35	MENKALINAN	b Aur	2.07	88.97	1.83	44.94	.01
36	A. MANUS	c Aur	2.71	89.08	1.70	37.21	.01
37*	MIRZAM	b CMa	1.99	95.12	1.10	-17.93	-.05
38*	CANOPUS	a Car	-.86	95.71	.55	-52.67	-.06
39*	ALHENA	g Gem	1.93	98.71	1.45	16.44	-.09
40*	SIRIUS	a CMa	-1.58	100.74	1.10	-16.65	-.14
41		t Pup	2.83	102.17	.62	-50.55	-.12
42*	ADHARA	e CMa	1.63	104.17	.98	-28.90	-.14
43*	WEZEN	d CMa	1.98	106.59	1.02	-26.31	-.16
44		p Pup	2.74	108.84	.88	-37.01	-.18
45	ALUDRA	h CMa	2.43	110.53	.99	-29.20	-.20
46*	CASTOR	a Gem	1.60	112.85	1.60	32.00	-.22

TABLE OF FIXED STARS EPOCH 1 JANUARY 1950

#	NAME	BAYER	MAG	RA	AVRA	DEC	AVDEC
47*	PROCYON	a CMi	.48	114.17	1.31	5.35	-.26
48*	POLLUX	b Gem	1.21	115.56	1.53	28.15	-.24
49		z Pup	2.27	120.46	.88	-39.86	-.28
50		r Pup	2.88	121.35	1.07	-24.16	-.29
51	REGOR	g Vel	2.22	122.00	.77	-47.19	-.30
52*	AVIOR	e Car	1.74	125.37	.51	-59.35	-.32
53		d Vel	2.01	130.83	.69	-54.52	-.37
54	SUHAIL	l Vel	2.22	136.54	.92	-43.23	-.40
55*	MIAPLACIDUS	b Car	1.80	138.17	.28	-69.51	-.41
56	TURAIS	i Car	2.25	138.94	.67	-59.07	-.42
57	MARKEB	k Car	2.63	140.14	.78	-54.80	-.43
58	ALPHARD	a Hya	2.16	141.28	1.23	-8.44	-.43
59*	REGULUS	a Leo	1.34	151.43	1.33	12.21	-.49
60	ALGEIBA	g Leo	2.61	154.30	1.38	20.10	-.51
61		m Vel	2.84	161.15	1.08	-49.16	-.53
62	MERAK	b UMa	2.44	164.71	1.51	56.65	-.54
63*	DUBHE	a UMa	1.95	165.16	1.54	62.02	-.54
64	ZOSMA	d Leo	2.58	167.86	1.33	20.80	-.55
65	DENEBOLA	b Leo	2.23	176.63	1.28	14.85	-.56
66	PHECDA	g UMa	2.54	177.80	1.31	53.97	-.56
67	GIENA	g Crv	2.78	183.31	1.29	-17.26	-.56
68*	ACRUX	a Cru	1.58	185.95	1.39	-62.82	-.55
69*	GACRUX	g Cru	1.61	187.09	1.39	-56.83	-.56
70	TSO HEA	b Crv	2.84	187.94	1.31	-23.12	-.55
71		a Mus	2.94	188.54	1.49	-68.86	-.55
72	MUHLIFAIN	g Cen	2.38	189.69	1.38	-48.69	-.55
73*	MIMOSA	b Cru	1.50	191.20	1.46	-59.42	-.55
74*	ALIOTH	e UMa	1.68	192.96	1.10	56.23	-.54
75	COR CAROLI	a CVn	2.90	193.42	1.17	38.59	-.54
76	VINDEMIATRIX	e Vir	2.95	194.92	1.25	11.23	-.54
77	MIZAR	z UMa	2.40	200.48	1.01	55.19	-.52
78*	SPICA	a Vir	1.21	200.64	1.32	-10.90	-.52
79		e Cen	2.56	204.18	1.58	-53.21	-.51
80*	BENETNASH	h UMa	1.91	206.39	.98	49.56	-.50
81	MUFRID	h Boo	2.80	208.08	1.19	18.65	-.50
82*	AGENA	b Cen	.86	210.07	1.77	-60.13	-.48
83	MENKENT	c Cen	2.26	210.93	1.47	-36.12	-.49
84*	ARCTURUS	a Boo	.24	213.34	1.14	19.44	-.52
85	SEGINUS	g Boo	3.00	217.52	1.01	38.53	-.44
86		h Cen	2.65	218.08	1.59	-41.94	-.44
87*	BUNGULA	a Cen	.11	219.05	1.70	-60.63	-.41
88	YANG MUN	a Lup	2.89	219.65	1.66	-47.17	-.43
89		e Boo	2.70	220.70	1.09	27.28	-.42
90	S. SCALE	a Lib	2.90	222.03	1.38	-15.84	-.42
91	KOCHAB	b UMi	2.24	222.71	-.07	74.36	-.41
92	KE KWAN	b Lup	2.81	223.81	1.64	-42.93	-.40

TABLE OF FIXED STARS EPOCH 1 JANUARY 1950

#	NAME	BAYER	MAG	RA	AVRA	DEC	AVDEC
93	N. SCALE	b Lib	2.74	228.58	1.35	-9.20	-.37
94		g Lup	2.95	232.95	1.67	-41.00	-.34
95	ALPHECCA	a CrB	2.31	233.14	1.06	26.88	-.34
96	UNUKALHAI	a Ser	2.75	235.45	1.23	6.58	-.31
97	ISIDIS	d Sco	2.54	239.34	1.48	-22.48	-.28
98	GRAFFIAS	b Sco	2.90	240.63	1.45	-19.67	-.27
99	SHANG TSAE	h Dra	2.89	245.83	.34	61.63	-.23
100*	ANTARES	a Sco	1.22	246.58	1.53	-26.32	-.22
101	KORNEFOROS	b Her	2.81	247.02	1.08	21.60	-.22
102	ALNIYAT	t Sco	2.91	248.19	1.56	-28.11	-.21
103	HAN	z Oph	2.70	248.60	1.38	-10.47	-.20
104*	ALPHATRA	a TrA	1.88	250.84	2.65	-68.94	-.18
105	WEI	e Sco	2.36	251.73	1.62	-34.20	-.18
106	SABIK	h Oph	2.63	256.88	1.43	-15.66	-.12
107	LOW	b Ara	2.80	260.28	2.08	-55.49	-.10
108	LESATH	u Sco	2.80	261.84	1.70	-37.26	-.08
109	CHOO	a Ara	2.97	261.99	1.93	-49.84	-.08
110	RASTABAN	b Dra	2.99	262.33	.57	52.34	-.07
111*	SHAULA	l Sco	1.71	262.55	1.70	-37.07	-.07
112	RASALHAGUE	a Oph	2.14	263.15	1.16	12.59	-.07
113	SARGAS	c Sco	2.04	263.43	1.80	-42.97	-.06
114		k Sco	2.51	264.76	1.73	-39.01	-.05
115	CHELEB	b Oph	2.94	265.25	1.23	4.59	-.04
116	ETTANIN	g Dra	2.42	268.86	.58	51.49	-.01
117	KAUS MEDIA	d Sgr	2.84	274.45	1.60	-29.85	.04
118*	KAUS AUST.	e Sgr	1.95	275.21	1.66	-34.41	.05
119	KAUS BOR.	l Sgr	2.94	276.22	1.54	-25.45	.06
120*	VEGA	a Lyr	.14	278.81	.85	38.74	.09
121	PELAGUS	s Sgr	2.14	283.04	1.55	-26.36	.12
122	ASCELLA	z Sgr	2.71	284.86	1.59	-29.95	.14
123	TARAZED	g Aql	2.80	295.97	1.19	10.49	.24
124*	ALTAIR	a Aql	.89	297.09	1.22	8.73	.26
125	SADR	g Cyg	2.32	305.11	.90	40.10	.32
126	PEACOCK	a Pav	2.12	305.43	1.98	-56.90	.32
127*	DENEB	a Cyg	1.33	309.93	.85	45.10	.36
128	ALJANAH	e Cyg	2.64	311.05	1.01	33.78	.37
129	ALDERAMIN	a Cep	2.60	319.35	.60	62.37	.42
130	ENIF	e Peg	2.54	325.43	1.23	9.64	.46
131	D. ALGEDI	d Cap	2.98	326.07	1.38	-16.36	.45
132	ALNAIR	a Gru	2.16	331.27	1.58	-47.20	.48
133		a Tuc	2.91	333.77	1.71	-60.51	.50
134		b Gru	2.24	339.92	1.49	-47.15	.52
135*	FOMALHAUT	a PsA	1.29	343.72	1.38	-29.89	.53
136	SCHEAT	b Peg	2.61	345.34	1.21	27.81	.54
137	MARKAB	a Peg	2.57	345.57	1.25	14.94	.54

TABLE OF LONGITUDES OF FIXED STARS EPOCH 1 JANUARY 1950

1 AR 53 = 6
12 AR 05 = 129
13 AR 37 = 1
29 AR 42 = 8
3 TA 16 = 12
4 TA 25 = 2
6 TA 58 = 14
7 TA 05 = 5
13 TA 14 = 7
13 TA 32 = 13
13 TA 37 = 15
17 TA 14 = 9
25 TA 28 = 16
29 TA 18 = 18*
1 GE 23 = 17*
2 GE 26 = 19
4 GE 59 = 20
9 GE 05 = 21*
14 GE 35 = 22
16 GE 08 = 23*
20 GE 15 = 25*
20 GE 41 = 28
21 GE 10 = 24*
21 GE 28 = 31
21 GE 40 = 27
21 GE 53 = 26*
22 GE 18 = 29
22 GE 46 = 30*
23 GE 59 = 32
25 GE 42 = 33
27 GE 52 = 11*
28 GE 03 = 34*
29 GE 13 = 35
29 GE 15 = 36
6 CN 29 = 37*
8 CN 24 = 39*
13 CN 24 = 40*
14 CN 16 = 38*
19 CN 33 = 46*
20 CN 04 = 42*
22 CN 32 = 48*
22 CN 42 = 43*
25 CN 06 = 47*
27 CN 02 = 41
28 CN 51 = 45
29 CN 37 = 44
10 LE 42 = 50
12 LE 36 = 91
14 LE 30 = 63*
17 LE 52 = 49
18 LE 44 = 62
26 LE 35 = 58
26 LE 40 = 51
28 LE 55 = 60
29 LE 08 = 59*
29 LE 46 = 66
8 VI 13 = 74*
10 VI 30 = 54
10 VI 37 = 64
14 VI 59 = 77
18 VI 16 = 53
20 VI 55 = 65
22 VI 27 = 52*
23 VI 52 = 75
26 VI 14 = 80*
28 VI 12 = 57
4 LI 39 = 56
9 LI 15 = 76
9 LI 49 = 61
10 LI 02 = 67
13 LI 46 = 99
16 LI 40 = 70
16 LI 58 = 85
18 LI 38 = 81
23 LI 09 = 78*
23 LI 32 = 84*
27 LI 24 = 89
1 SC 18 = 55*
1 SC 38 = 72
6 SC 03 = 69*
10 SC 57 = 73*
11 SC 11 = 68*
11 SC 35 = 95
11 SC 37 = 83
14 SC 23 = 90
14 SC 52 = 79
18 SC 40 = 93
19 SC 33 = 86
19 SC 41 = 71
21 SC 22 = 96
22 SC 48 = 88
23 SC 06 = 82*
24 SC 20 = 92
28 SC 51 = 87*
0 SG 24 = 101
0 SG 48 = 94
1 SG 52 = 97
2 SG 29 = 98
8 SG 32 = 103
9 SG 04 = 100*
10 SG 46 = 102
11 SG 16 = 110
14 SG 39 = 105
17 SG 16 = 106
20 SG 12 = 104*
21 SG 45 = 112
23 SG 19 = 108
23 SG 30 = 107
23 SG 53 = 111*
24 SG 14 = 109
24 SG 38 = 115
24 SG 54 = 113
25 SG 46 = 114
27 SG 16 = 116
3 CP 53 = 117
4 CP 23 = 118*
5 CP 37 = 119
11 CP 41 = 121
12 CP 56 = 122
14 CP 37 = 120*
23 CP 07 = 126
0 AQ 14 = 3
0 AQ 15 = 123
1 AQ 04 = 124*
8 AQ 58 = 133
15 AQ 12 = 132
21 AQ 37 = 134
22 AQ 50 = 131
24 AQ 09 = 125
27 AQ 03 = 128
1 PI 11 = 130
3 PI 09 = 135*
4 PI 38 = 127*
14 PI 36 = 10*
14 PI 47 = 4
22 PI 47 = 137
28 PI 41 = 136

TABLE OF OBLIQUE ASCENSIONS OF FIXED STARS AT 5 DEGREES NORTH LATITUDE

2 = 5
5 = 7
11 = 4
12 = 9
12 = 6
13 = 8
26 = 13
26 = 12
29 = 14
29 = 3
32 = 10*
42 = 16
44 = 17*
45 = 15
54 = 18*
54 = 20
55 = 19
67 = 21*
73 = 24*
77 = 22
78 = 26*
79 = 23*
80 = 25*

82 = 27
84 = 30*
84 = 29
84 = 35
84 = 28
85 = 32
85 = 36
87 = 33
87 = 34*
88 = 31
97 = 37*
97 = 39*
102 = 40*
102 = 38*
107 = 42*
108 = 41
109 = 43*
110 = 46*
113 = 44
113 = 48*
113 = 45
114 = 47*
124 = 50

125 = 49
127 = 51
134 = 52*
138 = 53
141 = 54
142 = 58
147 = 57
147 = 56
150 = 59*
152 = 55*
152 = 60
156 = 63*
157 = 62
166 = 64
167 = 61
171 = 66
175 = 65
185 = 67
185 = 74*
189 = 75
190 = 70
193 = 77
194 = 76

195 = 69*
195 = 72
196 = 68*
200 = 73*
201 = 80*
202 = 78*
202 = 71
204 = 91
206 = 81
211 = 79
212 = 84*
214 = 85
215 = 83
218 = 89
219 = 82*
223 = 86
223 = 90
225 = 88
228 = 87*
228 = 92
229 = 93
231 = 95
235 = 96

237 = 99
237 = 94
241 = 97
242 = 98
245 = 101
249 = 100*
250 = 103
251 = 102
255 = 105
256 = 110
258 = 106
262 = 112
263 = 116
264 = 104*
265 = 115
266 = 108
266 = 111*
268 = 107
268 = 109
268 = 113
269 = 114
275 = 120*
277 = 117

279 = 119
279 = 118*
286 = 121
288 = 122
295 = 123
296 = 124*
301 = 125
305 = 127*
308 = 128
310 = 129
313 = 126
325 = 130
328 = 131
337 = 132
343 = 133
343 = 136
344 = 137
345 = 134
347 = 135*
353 = 2
359 = 1

TABLE OF OBLIQUE DESCENSIONS OF FIXED STARS AT 5 DEGREES NORTH LATITUDE

1 = 4
4 = 1
9 = 6
10 = 2
16 = 10*
17 = 5
20 = 8
22 = 7
29 = 9
30 = 12
33 = 14
35 = 13
45 = 15
51 = 16
56 = 17*
58 = 18*
61 = 19
63 = 20
70 = 21*
76 = 22
77 = 23*
81 = 28
81 = 31

81 = 25*
82 = 27
83 = 29
83 = 30*
83 = 24*
84 = 26*
84 = 32
85 = 33
89 = 34*
89 = 38*
93 = 36
94 = 37*
94 = 35
96 = 41
99 = 40*
100 = 39*
101 = 42*
104 = 43*
105 = 44
108 = 45
115 = 47*
116 = 46*
116 = 49

117 = 51
117 = 52*
118 = 48*
119 = 50
124 = 53
125 = 55*
131 = 56
132 = 54
133 = 57
141 = 58
153 = 59*
155 = 61
156 = 60
170 = 64
172 = 62
175 = 63*
175 = 71
176 = 68*
178 = 65
179 = 69*
182 = 67
183 = 73*
184 = 72

185 = 66
186 = 70
196 = 76
197 = 75
197 = 79
200 = 78*
200 = 74*
201 = 82*
207 = 83
208 = 77
210 = 81
210 = 87*
212 = 80*
214 = 86
214 = 88
215 = 84*
219 = 92
221 = 90
222 = 85
223 = 89
228 = 93
229 = 94
236 = 95

236 = 96
237 = 97
238 = 104*
239 = 98
241 = 91
244 = 100*
246 = 102
248 = 103
248 = 105
249 = 101
253 = 107
255 = 99
255 = 106
256 = 109
258 = 108
259 = 113
259 = 111*
261 = 114
264 = 112
266 = 115
269 = 110
272 = 117
272 = 118*

274 = 119
275 = 116
281 = 121
282 = 122
283 = 120*
297 = 123
298 = 126
298 = 124*
309 = 125
314 = 128
315 = 127*
325 = 131
325 = 133
326 = 132
326 = 130
329 = 129
335 = 134
341 = 135*
342 = 3
347 = 137
348 = 136

TABLE OF OBLIQUE ASCENSIONS OF FIXED STARS AT 10 DEGREES NORTH LATITUDE

3 = 9
10 = 8
14 = 6
15 = 4
21 = 13
24 = 12
27 = 14
37 = 16
38 = 17*
40 = 10*
44 = 15
50 = 20
51 = 19
52 = 18*
59 = 3
65 = 21*
68 = 24*
75 = 26*
77 = 22
79 = 33
79 = 25*
79 = 23*
81 = 36

82 = 27
84 = 30*
84 = 29
85 = 32
86 = 28
87 = 34*
88 = 33
91 = 31
96 = 39*
98 = 37*
104 = 40*
107 = 46*
109 = 38*
110 = 42*
110 = 48*
112 = 43*
113 = 47*
115 = 41
116 = 45
116 = 44
126 = 50
129 = 49
133 = 51

143 = 52*
143 = 58
145 = 53
146 = 63*
146 = 54
149 = 62
149 = 59*
151 = 60
155 = 57
156 = 56
164 = 66
164 = 64
166 = 55*
173 = 61
174 = 65
178 = 74*
184 = 91
185 = 75
186 = 77
186 = 67
192 = 70
193 = 76
194 = 80*

201 = 72
203 = 78*
203 = 69*
205 = 81
206 = 68*
209 = 73*
209 = 85
210 = 84*
215 = 89
216 = 71
218 = 79
218 = 83
225 = 90
227 = 99
227 = 86
228 = 82*
228 = 95
230 = 93
231 = 88
233 = 92
234 = 96
237 = 87*
242 = 94

243 = 101
244 = 97
244 = 98
249 = 110
250 = 103
252 = 100*
254 = 102
256 = 116
259 = 105
260 = 106
261 = 112
264 = 115
270 = 108
270 = 111*
271 = 120*
273 = 113
273 = 114
274 = 109
275 = 107
279 = 104*
280 = 117
281 = 119
282 = 118*

288 = 121
291 = 122
294 = 123
296 = 124*
297 = 125
300 = 129
300 = 127*
304 = 128
321 = 126
324 = 130
329 = 131
340 = 136
342 = 132
343 = 137
345 = 2
350 = 135*
351 = 134
352 = 133
354 = 5
355 = 7
356 = 1

TABLE OF OBLIQUE DESCENSIONS OF FIXED STARS AT 10 DEGREES NORTH LATITUDE

7 = 6
7 = 1
8 = 10*
19 = 2
24 = 8
25 = 5
32 = 7
32 = 12
35 = 14
38 = 9
39 = 13
46 = 15
55 = 16
61 = 18*
62 = 17*
64 = 19
67 = 20
71 = 21*
75 = 22
77 = 23*
78 = 31
79 = 28
82 = 25*

82 = 29
82 = 27
82 = 38*
83 = 30*
84 = 32
85 = 33
86 = 26*
89 = 24*
89 = 34*
90 = 41
92 = 37*
97 = 36
98 = 40*
99 = 42*
99 = 35
101 = 44
102 = 43*
102 = 39*
105 = 45
108 = 52*
110 = 55*
111 = 51
112 = 49

115 = 47*
117 = 53
117 = 50
119 = 46*
121 = 48*
122 = 56
126 = 57
127 = 54
140 = 58
149 = 61
154 = 59*
158 = 60
161 = 71
166 = 68*
171 = 69*
172 = 64
174 = 73*
178 = 72
179 = 65
180 = 67
180 = 62
184 = 70
185 = 63*

191 = 79
192 = 66
192 = 82*
197 = 76
199 = 78*
201 = 87*
202 = 75
204 = 83
208 = 74*
209 = 88
209 = 86
211 = 81
214 = 92
215 = 77
217 = 84*
218 = 80*
219 = 90
224 = 104*
224 = 94
226 = 85
226 = 89
227 = 93
235 = 97

237 = 96
237 = 98
238 = 95
242 = 100*
243 = 102
245 = 105
245 = 107
247 = 103
250 = 109
251 = 101
254 = 113
254 = 106
254 = 108
255 = 111*
257 = 114
262 = 91
265 = 99
265 = 112
266 = 115
268 = 118*
269 = 117
271 = 119
276 = 110

278 = 121
279 = 122
282 = 116
287 = 120*
290 = 126
298 = 123
299 = 124*
313 = 3
314 = 125
316 = 133
318 = 128
320 = 127*
320 = 132
323 = 131
327 = 130
329 = 134
338 = 135*
339 = 129
348 = 137
351 = 136
357 = 4

TABLE OF OBLIQUE ASCENSIONS OF FIXED STARS AT 15 DEGREES NORTH LATITUDE

2 = 133
6 = 8
15 = 6
16 = 13
20 = 4
22 = 12
24 = 14
32 = 17*
33 = 16
44 = 15
46 = 20
48 = 19
49 = 10*
49 = 18*
62 = 24*
64 = 21*
72 = 26*
73 = 35
77 = 36
78 = 22
79 = 25*
80 = 23*
82 = 27

84 = 30*
85 = 29
85 = 32
86 = 34*
88 = 28
89 = 33
94 = 39*
95 = 31
100 = 37*
103 = 46*
105 = 40*
107 = 48*
113 = 42*
113 = 47*
114 = 43*
116 = 38*
119 = 45
120 = 44
121 = 41
128 = 50
133 = 49
135 = 63*
139 = 51

141 = 62
144 = 58
148 = 59*
149 = 60
150 = 91
151 = 54
152 = 52*
153 = 53
156 = 66
162 = 64
162 = 57
165 = 56
169 = 74*
173 = 65
178 = 77
179 = 61
181 = 75
184 = 55*
188 = 80*
188 = 67
192 = 76
195 = 70
203 = 81

204 = 78*
205 = 85
207 = 72
208 = 84*
211 = 69*
213 = 89
216 = 99
217 = 68*
218 = 73*
222 = 83
225 = 79
225 = 95
226 = 90
231 = 93
232 = 86
232 = 71
234 = 96
236 = 88
238 = 82*
238 = 92
241 = 101
242 = 110
246 = 97

246 = 98
246 = 94
247 = 87*
249 = 116
251 = 103
254 = 100*
256 = 102
260 = 112
261 = 106
262 = 105
264 = 115
266 = 120*
274 = 108
274 = 111*
277 = 114
278 = 113
281 = 109
283 = 107
283 = 117
284 = 119
286 = 118*
289 = 129
291 = 121

292 = 125
293 = 123
294 = 122
294 = 127*
295 = 124*
295 = 104*
301 = 128
323 = 130
330 = 126
331 = 131
335 = 2
337 = 136
341 = 137
345 = 7
346 = 5
348 = 132
353 = 135*
353 = 1
353 = 9
357 = 134

TABLE OF OBLIQUE DESCENSIONS OF FIXED STARS AT 15 DEGREES NORTH LATITUDE

5 = 6
10 = 1
28 = 8
28 = 2
33 = 5
34 = 12
38 = 14
42 = 7
44 = 13
46 = 15
48 = 9
60 = 16
63 = 18*
67 = 19
69 = 17*
72 = 20
73 = 21*
74 = 31
75 = 22
75 = 38*
76 = 23*
78 = 28
82 = 29

82 = 27
82 = 25*
83 = 30*
83 = 41
84 = 33
84 = 32
89 = 26*
90 = 34*
90 = 37*
92 = 55*
94 = 24*
96 = 42*
96 = 40*
97 = 44
98 = 52*
99 = 43*
101 = 36
102 = 45
103 = 39*
104 = 35
105 = 51
108 = 49
109 = 53

112 = 56
114 = 50
116 = 47*
118 = 57
122 = 54
122 = 46*
124 = 48*
139 = 58
143 = 61
145 = 71
154 = 68*
155 = 59*
160 = 60
163 = 69*
164 = 73*
172 = 72
174 = 64
179 = 67
181 = 65
181 = 70
182 = 82*
183 = 79
189 = 62

191 = 87*
195 = 63*
198 = 78*
198 = 76
199 = 66
200 = 83
203 = 88
204 = 86
206 = 75
207 = 104*
209 = 92
213 = 81
217 = 74*
218 = 90
219 = 84*
219 = 94
223 = 77
225 = 80*
226 = 93
229 = 89
230 = 85
233 = 97
235 = 98

237 = 96
237 = 107
239 = 100*
240 = 102
241 = 95
241 = 105
243 = 109
246 = 103
249 = 113
250 = 108
251 = 111*
252 = 114
253 = 106
253 = 101
265 = 118*
266 = 117
266 = 115
267 = 112
269 = 119
275 = 121
276 = 99
276 = 122
281 = 126

283 = 110
289 = 116
291 = 120*
296 = 91
299 = 123
299 = 124*
305 = 133
314 = 132
318 = 125
321 = 128
322 = 131
323 = 134
326 = 127*
328 = 130
335 = 135*
350 = 137
350 = 129
352 = 4
353 = 136
359 = 10*

TABLE OF OBLIQUE ASCENSIONS OF FIXED STARS AT 20 DEGREES NORTH LATITUDE

2 = 8
3 = 134
11 = 13
14 = 133
17 = 6
20 = 12
22 = 14
25 = 17*
25 = 4
28 = 16
41 = 20
43 = 15
45 = 19
47 = 18*
56 = 24*
59 = 10*
62 = 21*
68 = 35
69 = 26*
73 = 36
78 = 22
78 = 25*
81 = 23*

82 = 27
84 = 30*
85 = 32
85 = 34*
85 = 29
89 = 28
90 = 33
93 = 39*
99 = 31
100 = 46*
102 = 37*
104 = 48*
107 = 40*
112 = 47*
116 = 42*
117 = 43*
122 = 63*
122 = 45
124 = 38*
125 = 44
128 = 41
131 = 50
131 = 62

138 = 49
144 = 58
145 = 51
147 = 60
147 = 59*
148 = 66
157 = 54
160 = 64
160 = 74*
162 = 53
163 = 52*
169 = 77
171 = 65
171 = 57
176 = 56
177 = 75
181 = 80*
186 = 61
190 = 67
191 = 76
197 = 70
201 = 85
201 = 81

203 = 99
205 = 78*
206 = 84*
210 = 89
214 = 72
215 = 55*
221 = 69*
223 = 95
226 = 83
228 = 90
229 = 73*
231 = 68*
232 = 93
233 = 96
233 = 79
234 = 110
237 = 86
239 = 101
242 = 116
243 = 88
244 = 92
248 = 97
248 = 98

249 = 82*
251 = 94
252 = 103
257 = 100*
258 = 112
259 = 71
259 = 87*
259 = 102
262 = 120*
263 = 106
264 = 115
266 = 105
275 = 129
278 = 108
279 = 111*
282 = 114
283 = 113
286 = 119
287 = 117
287 = 125
288 = 109
289 = 127*
290 = 118*

292 = 123
292 = 107
293 = 121
294 = 124*
297 = 128
297 = 122
322 = 104*
322 = 130
325 = 2
332 = 131
333 = 7
334 = 136
336 = 5
339 = 126
340 = 137
342 = 9
350 = 1
354 = 132
356 = 135*

TABLE OF OBLIQUE DESCENSIONS OF FIXED STARS AT 20 DEGREES NORTH LATITUDE

3 = 6
3 = 129
13 = 1
32 = 8
36 = 12
39 = 2
40 = 14
42 = 5
46 = 15
49 = 13
53 = 7
60 = 9
61 = 55*
65 = 16
65 = 18*
67 = 38*
70 = 31
71 = 19
74 = 21*
74 = 22
75 = 23*
76 = 17*
76 = 28

76 = 41
76 = 20
81 = 29
82 = 27
83 = 33
83 = 25*
83 = 30*
84 = 32
87 = 52*
88 = 37*
91 = 34*
92 = 26*
93 = 42*
93 = 44
94 = 40*
96 = 43*
99 = 45
99 = 51
100 = 53
100 = 24*
102 = 56
103 = 49
105 = 39*

105 = 36
109 = 57
110 = 35
112 = 50
116 = 47*
117 = 54
118 = 71
126 = 46*
127 = 48*
136 = 61
138 = 58
141 = 68*
153 = 73*
153 = 69*
156 = 59*
162 = 60
165 = 72
171 = 82*
175 = 79
176 = 64
177 = 67
179 = 87*
179 = 70

180 = 104*
182 = 65
196 = 83
197 = 88
197 = 78*
198 = 62
199 = 86
199 = 76
204 = 92
208 = 66
208 = 63*
210 = 75
215 = 94
215 = 81
216 = 90
221 = 84*
225 = 93
226 = 74*
228 = 107
231 = 97
232 = 89
232 = 80*
232 = 77

233 = 98
234 = 85
236 = 100*
236 = 109
237 = 102
237 = 105
238 = 96
244 = 113
244 = 95
245 = 103
246 = 108
247 = 111*
248 = 114
251 = 106
255 = 101
261 = 118*
262 = 117
266 = 119
267 = 115
268 = 112
271 = 126
273 = 121
273 = 122

288 = 99
290 = 110
294 = 133
296 = 120*
296 = 116
300 = 123
300 = 124*
308 = 132
317 = 134
320 = 131
323 = 125
325 = 128
329 = 130
331 = 127*
332 = 135*
346 = 4
349 = 10*
351 = 137
356 = 136

TABLE OF OBLIQUE ASCENSIONS OF FIXED STARS AT 25 DEGREES NORTH LATITUDE

2 = 132
5 = 13
10 = 134
17 = 17*
18 = 12
19 = 6
20 = 14
23 = 16
29 = 133
31 = 4
36 = 20
41 = 19
43 = 15
44 = 18*
49 = 24*
60 = 21*
61 = 35
66 = 26*
68 = 36
71 = 10*
78 = 25*
79 = 22

82 = 23*
83 = 27
84 = 30*
85 = 34*
85 = 32
86 = 29
91 = 39*
91 = 33
91 = 28
96 = 46*
101 = 48*
103 = 31
104 = 63*
104 = 37*
109 = 40*
112 = 47*
119 = 42*
120 = 62
120 = 43*
126 = 45
129 = 44
133 = 38*

133 = 50
137 = 41
138 = 66
143 = 49
144 = 60
145 = 58
146 = 59*
149 = 74*
152 = 51
158 = 64
158 = 77
163 = 54
170 = 65
172 = 75
172 = 53
173 = 80*
177 = 52*
182 = 57
186 = 99
190 = 76
190 = 56
192 = 67

194 = 61
196 = 85
199 = 81
199 = 70
204 = 84*
206 = 78*
207 = 89
219 = 95
222 = 72
225 = 110
230 = 90
231 = 83
232 = 96
233 = 69*
233 = 93
233 = 116
236 = 101
243 = 79
243 = 86
243 = 73*
250 = 92
250 = 88

250 = 98
250 = 97
251 = 68*
254 = 103
256 = 129
257 = 120*
257 = 94
257 = 112
260 = 100*
263 = 102
263 = 115
264 = 82*
264 = 106
270 = 105
275 = 87*
282 = 125
282 = 127*
283 = 108
283 = 111*
287 = 114
289 = 119
289 = 113

290 = 117
291 = 123
293 = 128
293 = 124*
294 = 118*
296 = 109
296 = 121
300 = 122
303 = 107
311 = 2
318 = 7
321 = 130
325 = 5
327 = 9
331 = 136
334 = 131
338 = 137
347 = 1
351 = 126
357 = 8
359 = 135*

TABLE OF OBLIQUE DESCENSIONS OF FIXED STARS AT 25 DEGREES NORTH LATITUDE

1 = 6
16 = 1
22 = 129
36 = 8
38 = 12
43 = 14
47 = 15
52 = 2
54 = 5
55 = 13
58 = 38*
66 = 31
68 = 41
68 = 18*
69 = 7
70 = 16
73 = 52*
74 = 22
74 = 28
74 = 23*
74 = 9
75 = 19

76 = 21*
80 = 29
82 = 20
82 = 33
82 = 27
83 = 30*
84 = 17*
84 = 25*
84 = 32
86 = 37*
88 = 56
88 = 44
89 = 42*
90 = 53
92 = 34*
92 = 51
93 = 40*
93 = 43*
95 = 45
95 = 26*
98 = 49
99 = 57

107 = 39*
107 = 24*
109 = 50
110 = 36
111 = 54
117 = 47*
117 = 35
121 = 68*
129 = 61
130 = 46*
130 = 48*
137 = 58
139 = 73*
142 = 69*
156 = 82*
157 = 59*
158 = 72
163 = 87*
164 = 60
166 = 79
175 = 67
176 = 70

178 = 64
184 = 65
189 = 88
191 = 83
193 = 86
195 = 78*
198 = 92
200 = 76
209 = 94
210 = 62
214 = 90
215 = 75
217 = 81
218 = 107
218 = 66
223 = 84*
224 = 93
227 = 63*
228 = 97
228 = 109
231 = 98
233 = 100*

233 = 105
234 = 102
235 = 89
237 = 74*
238 = 113
239 = 96
239 = 85
240 = 80*
241 = 108
242 = 111*
243 = 114
243 = 77
244 = 103
247 = 95
249 = 106
257 = 118*
258 = 101
259 = 117
260 = 126
263 = 119
267 = 115
269 = 112

269 = 122
270 = 121
278 = 133
299 = 110
301 = 120*
301 = 123
301 = 132
301 = 124*
305 = 116
306 = 99
310 = 134
318 = 131
328 = 135*
328 = 125
329 = 128
330 = 130
337 = 10*
338 = 127*
341 = 4
353 = 137
360 = 136

TABLE OF OBLIQUE ASCENSIONS OF FIXED STARS AT 30 DEGREES NORTH LATITUDE

3 = 135*
7 = 17*
8 = 126
10 = 132
15 = 12
16 = 16
17 = 14
18 = 134
21 = 6
30 = 20
37 = 19
38 = 4
41 = 18*
42 = 24*
43 = 15
54 = 35
58 = 21*
62 = 26*
63 = 36
77 = 25*
79 = 22
83 = 27
83 = 23*
84 = 34*
84 = 30*
86 = 32
87 = 29
89 = 39*
89 = 10*
92 = 46*
92 = 33
93 = 28
98 = 48*
103 = 62
106 = 37*
107 = 31
111 = 40*
111 = 47*
123 = 42*
123 = 43*
125 = 66
129 = 45
133 = 74*
135 = 44
136 = 50
142 = 60
144 = 59*
144 = 77
145 = 38*
146 = 58
147 = 41
149 = 49
155 = 64
161 = 51
164 = 80*
166 = 75
168 = 65
169 = 54
185 = 53
188 = 76
190 = 85
194 = 67
195 = 57
197 = 81
202 = 84*
202 = 70
202 = 52*
203 = 61
203 = 89
207 = 78*
213 = 56
214 = 110
216 = 95
222 = 116
231 = 72
231 = 90
232 = 96
234 = 101
234 = 93
236 = 83
249 = 69*
249 = 86
251 = 120*
253 = 98
253 = 97
255 = 79
255 = 103
256 = 112
256 = 92
258 = 88
263 = 115
263 = 94
263 = 100*
266 = 102
266 = 106
269 = 73*
275 = 127*
275 = 105
276 = 125
288 = 108
288 = 128
288 = 111*
289 = 2
290 = 123
292 = 124*
292 = 119
293 = 114
293 = 9
294 = 117
296 = 113
299 = 118*
300 = 121
304 = 122
305 = 109
310 = 5
317 = 107
320 = 130
328 = 136
336 = 131
337 = 137
343 = 1
353 = 8
359 = 13

TABLE OF OBLIQUE DESCENSIONS OF FIXED STARS AT 30 DEGREES NORTH LATITUDE

3 = 136
20 = 1
40 = 12
41 = 8
45 = 14
47 = 38*
47 = 15
48 = 52*
58 = 41
61 = 31
62 = 13
64 = 56
69 = 5
71 = 18*
72 = 28
73 = 23*
73 = 22
75 = 2
76 = 16
77 = 53
78 = 21*
79 = 19
80 = 29
81 = 33
82 = 27
83 = 30*
83 = 44
83 = 32
83 = 51
84 = 25*
84 = 37*
85 = 57
86 = 42*
87 = 20
90 = 43*
91 = 40*
92 = 49
92 = 45
92 = 34*
93 = 17*
99 = 26*
104 = 54
106 = 50
108 = 9
109 = 39*
114 = 73*
115 = 24*
115 = 36
117 = 47*
119 = 61
124 = 35
125 = 69*
134 = 48*
134 = 46*
136 = 58
149 = 72
154 = 79
159 = 59*
166 = 60
173 = 67
174 = 70
181 = 64
181 = 88
185 = 65
186 = 83
187 = 86
191 = 92
194 = 78*
202 = 76
203 = 94
203 = 107
213 = 90
219 = 109
219 = 81
221 = 75
223 = 93
225 = 84*
226 = 97
226 = 62
229 = 105
229 = 98
230 = 100*
230 = 102
230 = 66
231 = 113
236 = 108
237 = 111*
237 = 114
238 = 89
239 = 96
242 = 103
243 = 126
245 = 85
248 = 106
249 = 80*
250 = 95
252 = 118*
253 = 74*
255 = 117
257 = 77
260 = 101
260 = 119
265 = 122
266 = 121
268 = 115
271 = 112
293 = 132
301 = 134
302 = 123
302 = 124*
306 = 120*
311 = 110
315 = 116
316 = 131
319 = 10*
324 = 135*
331 = 130
334 = 128
334 = 4
334 = 125
345 = 127*
354 = 137
359 = 6

TABLE OF OBLIQUE ASCENSIONS OF FIXED STARS AT 35 DEGREES NORTH LATITUDE

7 = 135*
9 = 16
13 = 12
14 = 14
20 = 132
23 = 20
24 = 6
29 = 134
32 = 24*
32 = 19
38 = 18*
42 = 15
45 = 35
46 = 4
56 = 21*
57 = 36
58 = 26*
76 = 25*
80 = 22
83 = 27
83 = 34*
84 = 23*
84 = 30*
86 = 32
87 = 39*
87 = 46*
87 = 29
93 = 33
94 = 48*
96 = 28
103 = 66
108 = 37*
110 = 47*
113 = 31
113 = 40*
127 = 43*
127 = 42*
134 = 45
139 = 60
140 = 50
141 = 44
143 = 59*
147 = 58
151 = 80*
152 = 64
156 = 49
159 = 75
161 = 41
162 = 38*
166 = 65
171 = 51
178 = 54
184 = 85
187 = 76
194 = 81
196 = 67
197 = 110
199 = 84*
200 = 89
205 = 70
207 = 116
208 = 78*
210 = 53
212 = 95
215 = 61
223 = 57
231 = 96
231 = 101
233 = 90
235 = 93
242 = 83
242 = 72
245 = 120*
254 = 112
255 = 98
256 = 103
256 = 97
257 = 86
262 = 115
264 = 92
265 = 127*
267 = 100*
268 = 106
269 = 88
269 = 125
270 = 102
270 = 94
274 = 79
280 = 105
283 = 128
289 = 123
291 = 124*
294 = 108
294 = 111*
296 = 119
298 = 117
299 = 114
303 = 121
304 = 118*
304 = 113
309 = 122
318 = 109
319 = 130
324 = 136
335 = 137
338 = 131
339 = 1
347 = 8
351 = 13
355 = 17*

TABLE OF OBLIQUE DESCENSIONS OF FIXED STARS AT 35 DEGREES NORTH LATITUDE

7 = 136
24 = 1
29 = 38*
43 = 12
44 = 41
47 = 8
48 = 15
49 = 14
52 = 53
56 = 31
57 = 57
69 = 13
70 = 28
72 = 23*
73 = 22
73 = 51
74 = 18*
77 = 44
79 = 29
79 = 33
80 = 21*
81 = 42*
82 = 37*
82 = 27
83 = 30*
83 = 32
83 = 16
83 = 19
85 = 49
85 = 25*
86 = 43*
87 = 45
89 = 40*
93 = 34*
94 = 20
95 = 54
103 = 50
103 = 26*
106 = 17*
107 = 61
111 = 39*
118 = 47*
121 = 36
125 = 24*
133 = 35
135 = 79
135 = 58
137 = 72
138 = 48*
139 = 46*
160 = 59*
169 = 60
171 = 70
171 = 88
171 = 67
179 = 86
180 = 83
183 = 92
183 = 64
187 = 65
193 = 78*
195 = 94
203 = 76
206 = 109
211 = 90
222 = 81
222 = 93
222 = 97
223 = 113
223 = 105
226 = 98
226 = 102
226 = 100*
227 = 75
228 = 84*
230 = 108
230 = 114
231 = 111*
240 = 96
241 = 103
242 = 89
246 = 106
247 = 118*
251 = 117
251 = 85
252 = 66
254 = 95
257 = 119
261 = 122
262 = 80*
263 = 121
263 = 101
268 = 115
272 = 112
282 = 132
291 = 134
303 = 124*
303 = 123
313 = 120*
314 = 131
320 = 135*
326 = 4
327 = 110
331 = 116
332 = 130
339 = 128
341 = 125
355 = 127*
356 = 137
357 = 6

TABLE OF OBLIQUE ASCENSIONS OF FIXED STARS AT 40 DEGREES NORTH LATITUDE

10 = 12
10 = 14
13 = 135*
14 = 20
18 = 24*
26 = 6
26 = 19
32 = 35
34 = 18*
36 = 132
42 = 15
45 = 134
49 = 36
54 = 26*
54 = 21*
56 = 4
75 = 25*
81 = 22
81 = 46*
82 = 34*
83 = 27
84 = 39*
84 = 30*
85 = 23*
86 = 32
88 = 29
89 = 48*
95 = 33
98 = 28
110 = 47*
111 = 37*
115 = 40*
119 = 31
126 = 80*
131 = 43*
132 = 42*
136 = 60
139 = 45
141 = 59*
143 = 50
148 = 44
148 = 58
149 = 64
151 = 75
164 = 65
165 = 49
176 = 85
185 = 76
187 = 51
189 = 54
192 = 81
195 = 89
196 = 84*
198 = 67
208 = 95
209 = 70
210 = 78*
228 = 101
230 = 96
236 = 90
236 = 93
237 = 120*
237 = 61
249 = 83
252 = 112
253 = 127*
258 = 103
258 = 98
260 = 97
260 = 125
261 = 115
262 = 72
267 = 86
270 = 106
271 = 100*
275 = 102
275 = 92
277 = 128
280 = 94
285 = 88
287 = 105
287 = 123
290 = 124*
300 = 119
302 = 108
302 = 111*
303 = 117
308 = 114
308 = 121
310 = 118*
314 = 122
315 = 113
317 = 130
319 = 136
329 = 17*
333 = 137
334 = 1
340 = 8
340 = 131
341 = 13
346 = 109
360 = 16

TABLE OF OBLIQUE DESCENSIONS OF FIXED STARS AT 40 DEGREES NORTH LATITUDE

7 = 127*
12 = 136
29 = 1
46 = 12
48 = 15
50 = 31
52 = 14
53 = 8
57 = 51
67 = 28
70 = 44
71 = 23*
72 = 22
76 = 49
77 = 42*
78 = 18*
78 = 33
78 = 29
79 = 37*
79 = 13
82 = 43*
82 = 27
82 = 30*
83 = 45
83 = 21*
83 = 32
84 = 54
85 = 61
86 = 25*
86 = 40*
89 = 19
93 = 16
94 = 34*
99 = 50
103 = 20
108 = 26*
113 = 39*
117 = 72
119 = 47*
129 = 36
132 = 17*
134 = 58
138 = 24*
142 = 48*
144 = 46*
146 = 35
155 = 88
162 = 59*
167 = 70
168 = 67
169 = 86
172 = 60
172 = 92
173 = 83
178 = 109
186 = 94
186 = 64
189 = 65
191 = 78*
205 = 76
208 = 90
212 = 113
217 = 105
219 = 97
221 = 93
222 = 102
222 = 114
222 = 100*
222 = 108
223 = 98
223 = 111*
225 = 81
231 = 84*
235 = 75
240 = 103
240 = 118*
241 = 96
243 = 106
246 = 117
246 = 89
253 = 119
256 = 122
258 = 95
258 = 121
259 = 85
266 = 132
266 = 101
269 = 115
274 = 112
275 = 134
286 = 80*
304 = 124*
305 = 123
312 = 131
315 = 135*
316 = 4
321 = 120*
334 = 130
345 = 128
350 = 125
354 = 6
359 = 137

TABLE OF OBLIQUE ASCENSIONS OF FIXED STARS AT 45 DEGREES NORTH LATITUDE

2 = 20
3 = 35
6 = 14
6 = 12
19 = 135*
20 = 19
30 = 6
30 = 18*
40 = 36
41 = 15
48 = 26*
51 = 21*
73 = 4
74 = 46*
74 = 25*
81 = 34*
82 = 22
82 = 39*
83 = 27
83 = 48*
85 = 30*
86 = 23*
87 = 32
89 = 29
96 = 33
101 = 28
109 = 47*
114 = 37*
118 = 40*
127 = 31
133 = 60
136 = 43*
138 = 42*
139 = 59*
140 = 75
145 = 45
146 = 64
148 = 50
150 = 58
158 = 44
161 = 65
165 = 85
177 = 49
183 = 76
188 = 81
190 = 89
193 = 84*
201 = 67
203 = 95
207 = 54
212 = 78*
213 = 70
224 = 101
225 = 120*
229 = 96
238 = 93
239 = 90
248 = 125
250 = 112
258 = 83
259 = 103
261 = 115
262 = 98
264 = 97
269 = 128
273 = 106
276 = 100*
280 = 102
282 = 86
285 = 123
288 = 124*
292 = 92
293 = 94
295 = 105
305 = 119
309 = 117
311 = 108
312 = 111*
313 = 121
314 = 136
316 = 130
318 = 118*
319 = 114
320 = 122
326 = 13
328 = 1
330 = 137
332 = 8
332 = 113
343 = 131
347 = 16

TABLE OF OBLIQUE DESCENSIONS OF FIXED STARS AT 45 DEGREES NORTH LATITUDE

1 = 137
2 = 125
17 = 136
35 = 1
42 = 31
49 = 15
50 = 12
57 = 14
60 = 44
62 = 8
64 = 28
64 = 49
66 = 54
70 = 23*
71 = 42*
71 = 22
76 = 37*
77 = 33
77 = 45
77 = 43*
77 = 29
82 = 27
82 = 30*
83 = 18*
83 = 32
83 = 40*
85 = 21*
87 = 25*
95 = 50
95 = 13
96 = 34*
96 = 19
106 = 16
114 = 26*
115 = 20
116 = 39*
120 = 47*
133 = 58
138 = 36
148 = 48*
152 = 46*
154 = 86
155 = 92
163 = 70
164 = 59*
164 = 83
165 = 67
173 = 94
175 = 35
176 = 60
190 = 78*
190 = 64
192 = 65
195 = 113
206 = 90
206 = 76
209 = 105
211 = 114
212 = 108
213 = 111*
215 = 97
216 = 102
217 = 100*
219 = 93
220 = 98
228 = 81
232 = 118*
234 = 84*
238 = 103
239 = 117
241 = 106
242 = 96
246 = 75
248 = 119
250 = 122
252 = 89
253 = 121
264 = 95
270 = 115
270 = 85
270 = 101
276 = 112
299 = 4
306 = 124*
307 = 123
309 = 135*
309 = 131
332 = 120*
335 = 130
351 = 6
353 = 128

TABLE OF OBLIQUE ASCENSIONS OF FIXED STARS AT 50 DEGREES NORTH LATITUDE

0 = 14
1 = 12
10 = 19
24 = 18*
24 = 36
27 = 135*
33 = 6
40 = 15
40 = 26*
48 = 21*
65 = 46*
73 = 25*
76 = 48*
78 = 39*
79 = 34*
83 = 22
83 = 27
85 = 30*
87 = 32
88 = 23*
90 = 29
98 = 33
105 = 28
108 = 47*
118 = 37*
121 = 75
122 = 40*
128 = 60
136 = 59*
138 = 31
141 = 64
143 = 43*
145 = 42*
146 = 85
151 = 58
152 = 45
154 = 50
158 = 65
173 = 44
181 = 76
183 = 89
184 = 81
188 = 84*
196 = 95
205 = 49
205 = 67
206 = 120*
214 = 78*
219 = 70
219 = 101
228 = 96
240 = 93
242 = 90
248 = 112
258 = 128
260 = 115
261 = 103
266 = 98
269 = 97
271 = 83
276 = 106
283 = 100*
283 = 123
287 = 124*
288 = 102
306 = 105
306 = 136
311 = 119
314 = 130
318 = 117
319 = 8
319 = 121
320 = 1
327 = 111*
327 = 108
327 = 137
328 = 122
330 = 118*
334 = 20
340 = 114
347 = 131

TABLE OF OBLIQUE DESCENSIONS OF FIXED STARS AT 50 DEGREES NORTH LATITUDE

4 = 128
4 = 137
24 = 136
31 = 31
36 = 49
42 = 1
45 = 44
50 = 15
55 = 12
60 = 28
62 = 14
63 = 42*
68 = 23*
69 = 45
70 = 22
70 = 43*
72 = 37*
74 = 8
75 = 33
76 = 29
80 = 40*
82 = 30*
82 = 27
82 = 32
88 = 18*
88 = 25*
89 = 21*
89 = 50
97 = 34*
105 = 19
119 = 39*
121 = 47*
121 = 26*
131 = 58
143 = 20
150 = 83
154 = 36
155 = 48*
157 = 70
161 = 46*
162 = 67
166 = 59*
180 = 60
187 = 78*
190 = 114
195 = 64
195 = 65
197 = 108
198 = 105
198 = 111*
202 = 90
209 = 76
209 = 102
210 = 97
210 = 100*
215 = 98
217 = 93
220 = 118*
231 = 117
232 = 81
236 = 103
237 = 106
238 = 84*
241 = 122
242 = 119
243 = 96
247 = 121
259 = 89
265 = 75
270 = 95
271 = 115
275 = 101
279 = 112
289 = 85
300 = 135*
306 = 131
308 = 124*
309 = 123
337 = 130
347 = 6
352 = 120*

TABLE OF OBLIQUE ASCENSIONS OF FIXED STARS AT 55 DEGREES NORTH LATITUDE

17 = 18*
30 = 26*
38 = 6
39 = 135*
39 = 15
43 = 21*
50 = 46*
66 = 48*
72 = 25*
74 = 39*
77 = 34*
83 = 27
84 = 22
85 = 30*
87 = 32
90 = 23*
92 = 29
100 = 33
106 = 47*
110 = 28
123 = 37*
123 = 60
126 = 40*
133 = 59*
135 = 64
152 = 43*
154 = 58
154 = 65
156 = 42*
160 = 31
161 = 50
163 = 45
173 = 89
178 = 76
179 = 81
183 = 84*
187 = 95
210 = 67
213 = 101
217 = 78*
226 = 70
226 = 96
238 = 128
242 = 93
245 = 112
246 = 90
259 = 115
264 = 103
271 = 98
276 = 97
280 = 106
281 = 123
284 = 124*
292 = 100*
296 = 136
298 = 102
310 = 1
311 = 130
319 = 119
323 = 137
328 = 105
328 = 121
329 = 117
340 = 122
351 = 131
353 = 118*
353 = 14
356 = 12
356 = 19

TABLE OF OBLIQUE DESCENSIONS OF FIXED STARS AT 55 DEGREES NORTH LATITUDE

8 = 137
9 = 31
24 = 128
34 = 136
50 = 15
52 = 42*
53 = 1
55 = 28
58 = 45
60 = 12
62 = 43*
66 = 23*
68 = 37*
69 = 14
69 = 22
72 = 33
75 = 29
75 = 40*
82 = 50
82 = 30*
82 = 32
82 = 27
90 = 25*
93 = 21*
96 = 18*
99 = 34*
120 = 19
122 = 47*
124 = 39*
129 = 58
132 = 26*
150 = 70
157 = 67
165 = 48*
169 = 59*
176 = 105
176 = 46*
185 = 78*
186 = 60
197 = 118*
198 = 90
198 = 102
199 = 65
201 = 64
202 = 100*
203 = 97
210 = 98
211 = 76
215 = 93
219 = 117
229 = 122
233 = 106
233 = 103
233 = 119
237 = 81
238 = 121
244 = 84*
245 = 96
268 = 89
272 = 115
280 = 95
281 = 101
282 = 112
289 = 135*
301 = 131
310 = 124*
311 = 123
339 = 130
342 = 6

TABLE OF OBLIQUE ASCENSIONS OF FIXED STARS AT 60 DEGREES NORTH LATITUDE

6 = 18*
10 = 26*
11 = 122
38 = 21*
38 = 15
45 = 6
48 = 48*
68 = 39*
68 = 135*
70 = 25*
75 = 34*
83 = 27
85 = 22
86 = 30*
88 = 32
93 = 23*
94 = 29
104 = 33
105 = 47*
115 = 60
117 = 28
127 = 64
129 = 37*
129 = 59*
132 = 40*
149 = 65
156 = 58
157 = 89
166 = 43*
172 = 95
172 = 81
172 = 50
175 = 76
176 = 84*
177 = 42*
186 = 45
204 = 101
216 = 67
220 = 78*
224 = 96
236 = 70
240 = 112
245 = 93
251 = 90
257 = 115
267 = 103
277 = 123
279 = 98
279 = 136
282 = 124*
285 = 97
286 = 106
289 = 1
306 = 100*
308 = 130
316 = 102
318 = 137
332 = 119
342 = 121
343 = 14
347 = 12
357 = 131
358 = 117

TABLE OF OBLIQUE DESCENSIONS OF FIXED STARS AT 60 DEGREES NORTH LATITUDE

13 = 137
31 = 42*
35 = 45
48 = 43*
49 = 28
51 = 136
52 = 15
61 = 37*
63 = 23*
67 = 22
68 = 12
69 = 33
70 = 40*
70 = 50
73 = 29
74 = 1
79 = 14
81 = 32
81 = 30*
82 = 27
92 = 25*
99 = 21*
101 = 34*
106 = 18*
124 = 47*
126 = 58
129 = 39*
140 = 70
151 = 67
151 = 26*
173 = 59*
180 = 102
181 = 78*
183 = 48*
188 = 100*
191 = 117
193 = 90
194 = 97
194 = 60
198 = 122
202 = 98
204 = 65
209 = 64
212 = 93
215 = 76
221 = 119
224 = 121
228 = 106
230 = 103
244 = 81
247 = 96
251 = 84*
259 = 135*
273 = 115
284 = 89
286 = 112
290 = 101
295 = 95
296 = 131
313 = 124*
315 = 123
335 = 6
343 = 130

TABLE OF OBLIQUE ASCENSIONS OF FIXED STARS AT 65 DEGREES NORTH LATITUDE

5 = 131
29 = 21*
37 = 15
55 = 6
59 = 39*
67 = 25*
72 = 34*
83 = 27
86 = 30*
87 = 22
89 = 32
96 = 29
96 = 23*
103 = 47*
103 = 60
108 = 33
113 = 64
124 = 59*
126 = 28
139 = 37*
141 = 40*
142 = 65
160 = 58
162 = 81
164 = 84*
170 = 76
189 = 101
195 = 50
221 = 96
225 = 78*
225 = 67
235 = 112
249 = 93
254 = 70
255 = 115
259 = 90
272 = 103
273 = 123
278 = 124*
291 = 98
294 = 106
302 = 97
304 = 130
311 = 137
324 = 14
334 = 12
344 = 18*

TABLE OF OBLIQUE DESCENSIONS OF FIXED STARS AT 65 DEGREES NORTH LATITUDE

20 = 137
39 = 28
47 = 50
51 = 37*
53 = 15
60 = 23*
61 = 40*
65 = 33
65 = 22
70 = 29
80 = 32
81 = 30*
82 = 12
82 = 27
94 = 25*
98 = 14
104 = 34*
107 = 21*
122 = 70
123 = 58
126 = 47*
128 = 18*
138 = 39*
142 = 67
176 = 78*
177 = 97
179 = 59*
185 = 90
191 = 98
206 = 60
208 = 93
211 = 65
220 = 106
220 = 76
222 = 64
225 = 103
250 = 96
254 = 81
263 = 84*
275 = 115
287 = 131
292 = 112
305 = 101
316 = 124*
319 = 123
325 = 6
347 = 130

CHAPTER XII: EVALUATION

Having presented the reader with a bewildering array of possible approaches to the question of calculating primary directions, it behooves the author to make some remarks upon his own experience with the various systems presented. The following evaluation should be regarded as one man's opinion, nothing more.

DIRECTIONS TO THE ANGLES

Initial experiments were made using directions to the angles (both mundane and zodiacal) in some fifty horoscopes rectified by other means (chiefly transits and secondary progressions to angles). What was being sought was another method of confirming the rectifications. Both the methods of Ptolemy and Naibod for equating arcs of direction to time were tested and rejected in favor of the Placidian True Solar Arc in RA.

It was found that planets directed to angles were often as efficacious in terms of significance of effect as planets progressed to angles; however primary directions have a higher rate of failure than do secondary progressions (especially when Neptune or Pluto is promissor; the sun, by contrast, almost always produces a major shift in life purpose when it is directed to an angle). Only the conjunction and opposition were found to be effective. The Vertex and Antivertex were not found to be effective significators.

The event corresponding to a planetary promissor directed to an angle usually climaxes within an orb of a month or two (occasionally three) from the calculated date. Sometimes simultaneous progressions or transits to the promissor or angle, especially by Mars or Uranus, assist in fixing the time of the expected event with greater exactitude. Claims of zero-orb accuracy (e.g. by Jayne, Pollich and Page) seem to be based upon a combination of wishful thinking and gross miscalculation.

Both zodiacal and mundane directions to angles can be valid; usually one or the other (sometimes neither, occasionally both) is more effective in a given case; therefore both types should be calculated for each native to ascertain which type yields a better correlation between predictions and actual events. However, mundane directions tend to work better than zodiacal directions in most cases.

The correlation being sought is between planetary directions to angles and major life events - the most significant events in the native's life, by his own estimate. These are events which profoundly alter the native's life movie: his images of who he is or wants to be (ASC - DESC), and his idea of what he is accomplishing or wants to accomplish (MC - IC). The planetary promissor symbolizes the impulse to action (e.g., the martial or jovial side of his being), and the houses it rules the likely circumstances in which the event will manifest. A benefic promissor will tend to bring out all the native's eagerness and enthusiasm, and a malefic promissor will tend to bring out his teeth-gnashing side; however this is subject to substantial individual variation depending upon the condition of the promissor by sign, aspect, etc. in the radix; and whether or not the native has come to terms with the impulse represented by that planet in his own life, i.e., whether he has "made friends" with that planet. In practice this must be traced out in each individual case history. No two natives will react to the same planetary impulse in the same way; however, a given native will tend to react to the same planetary impulse in much the same fashion throughout his life (whether that impulse comes by transit, progression, or direction). Hopefully there is some sort of maturation process going on in here, i.e., that the native is learning something about himself, his capabilities, his worth, etc. from his experiences, even if he keeps finding himself over and over again in the same situations. A planet directed to an angle shows a point in time when a complete break can be made in past patterns of conditioning and an altogether new start made in a new direction.

For example, a planet directed to (or transiting, or progressed to) the Ascendant shows a change of self-image. A situation arises in which "who" the native is or fancies himself to be is no longer adequate; it challenges his wonted self-images. He has to discard worn-out assumptions and open himself up to a broader view of his function in life. Hence moves, major journeys - any events which cause an environmental shift necessitating major emotional adjustments - are often shown by directions to the Ascendant; less often to the MC or IC (moves associated with the MC or IC are more for the sake of ambition or opportunity, less provocative of self-evaluation). Deaths of parents and others whose lives are tightly bound up with that of the native are often shown by malefic directions to the MC, IC, or occasionally the DESC. Marriage and other major relationships (such as births of children) are often shown by appropriate directions to the DESC or IC. And so on.

Accurate prediction is facilitated by knowledge of the context of the native's life generally. With some natives, it's all business; with others, love affairs; or journeys; or sports; or trips to the mental hospital. It is also helpful to know something of the immediate context of the native's life: what plans he has or decisions he must make.

INTERPLANETARY DIRECTIONS

Since the angles proved to be very effective significators (practically anything - stars, sign cusps, nodes, critical degrees, etc. - directed to them produces corresponding events in the life of the native), it was hoped that some method could be found to direct planets to one another, i.e., employ the planets as significators as well as promissors.

Accordingly, both mundane and zodiacal directions equated to time with the True Solar Arc in RA were computed and tested in some half dozen cases according to the Meridian, Campanus, Regiomontanus, and Placidus methods; but in no case was a significant correlation obtained between predictions and events. However, it was observed that in the case of Campanus-Regiomontanus mundane conjunctions and oppositions, there was often a link between a direction and its converse (obtained by interchanging the promissor and significator). The two events or epochs in life were sometimes linked causally, at other times there was merely a similarity of theme or tone. However this effect, albeit noticeable, was not deemed dependable enough for employment in predictive work.

No systems other than the four abovementioned have been tested, and even those tests were highly unrigorous, so much future work remains to be done along this line of investigation.

APPENDIX: FORMULAS

Formula A1: Obliquity of the Ecliptic

$$E = 23.4523 - .013\ T$$

where T is in fractions of a century from 1 January 1900 (positive if after 1900, negative if before it).

Formula A2: Longitude to RA

To compute the right ascension of any ecliptic point from its longitude L.

```
If $L = 90$ then $RA = 90$
If $L = 270$ then $RA = 270$
If $L \neq 90$ or $270$ then let $X = \arctan(\tan L \cos E)$
    If $0 \leq L < 90$ then $RA = X$
    If $90 < L < 270$ then $RA = X + 180$
    If $270 < L < 360$ then $RA = X + 360$
```

Formula A3: RA to Longitude

To compute the longitude of any ecliptic point from its right ascension RA.

```
If $RA = 90$ then $L = 90$
If $RA = 270$ then $L = 270$
If $RA \neq 90$ or $270$ then let $X = \arctan(\tan RA / \cos E)$
    If $0 \leq RA < 90$ then $L = X$
    If $90 < RA < 270$ then $L = X + 180$
    If $270 < RA < 360$ then $L = X + 360$
```

Formula A4: Longitude to Declination

To compute the declination of any ecliptic point from its longitude L.

$$D = \arcsin(\sin L \sin E)$$

Formula A5: Longitude and Latitude to Declination

To compute the declination of any point from its longitude L and celestial latitude B.

$$D = \arcsin(\cos E \sin B + \sin E \cos B \sin L)$$

Formula A6: Longitude and Declination to RA

To compute the right ascension of any point from its longitude L and its declination D.

```
If $L = 90$ then $RA = 90$
If $L = 270$ then $RA = 270$
If $L \neq 90$ or $270$ then let
    $X = \text{Arctan}(\tan L / \cos E) -$
  $\text{SGN}(\cos L) \times \text{Arcsin}(\tan D \sin E / \text{SQR}(\tan^2 L + \cos^2 E))$
If $0 \leq L < 90$ then $RA = X$
If $90 < L < 270$ then $RA = X + 180$
If $270 < L < 360$ then $RA = X + 360$
```

where SQR is the square root function and SGN is the sign function (p. 29). If $RA > 360$, subtract 360 and if $RA < 0$, add 360.

Formula A7: RA and Declination to Longitude

To compute the longitude of any point from its right ascension RA and its declination D.

```
If $RA = 90$ then $L = 90$
If $RA = 270$ then $L = 270$
If $RA \neq 90$ or $270$ then let $X =$

$\text{Arctan}((\cos E \sin RA + \sin E \tan D) / \cos RA)$

If $0 \leq RA < 90$ then $L = X$
If $90 < RA < 270$ then $L = X + 180$
If $270 < RA < 360$ then $L = X + 360$
```

If $L > 360$, subtract 360 and if $L < 0$, add 360.

Formula A8: Ascendant

To compute the longitude of the Ascendant from latitude Ø and RAMC;

To compute the longitude of the Vertex substituting co Ø for Ø and RAIC for RAMC;

To compute the longitude of any ecliptic point from its oblique ascension, substituting OA - 90 for RAMC.

```
Let $Y = \text{Arcsin}(\tan Ø \tan E)$
    If $RAMC = 180 + Y$ then $L = 270$
    If $RAMC = 360 - Y$ then $L = 90$
    If $RAMC \neq 180 + Y$ or $360 - Y$ then let

$X = \text{Arctan}(- \cos RAMC / (\tan Ø \sin E + \sin RAMC \cos E))$
If $0 \leq RAMC < 180 + Y$ then $L = X + 180$
If $180 + Y < RAMC < 270$ then $L = X + 360$
If $270 \leq RAMC < 360 - Y$ then $L = X$
If $360 - Y < RAMC < 360$ then $L = X + 180$
```

Where L is the required longitude. If Ø < 0, use -Ø in place of Ø, substitute RAIC for RAMC, and add 180 to L at the end.

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NCGR Journal Winter 1988-1989

Primary Directions

AN OVERVIEW

by Jerry Makransky

The subject of primary directions is fraught with confusion, and has historically been dealt with ineptly. For example, the primary directions described in most of the standard works on the subject (*e.g.*, DeLuce, Sepharial, Simmonite, Zadkiel) and those you get when you order primary directions from an astrological computing service, are wrong. They are based on formulae which purport to derive from the theory of Placidus, but they are incorrect. It turns out that there is a correct way of computing primary directions according to Placidus' theory; moreover, there are equally valid ways of computing primary directions according to the theories of Campanus, Regiomontanus, and indeed for every other house system, but these methods depend on the house system chosen for use.

My own interest in this subject arose from a desire to be able to predict the major events in a native's life, and to rectify uncertain birth times. I tried major transits, secondary progressions, and one-degree-per-year symbolic directions, but too often the most important life events—such as marriages, divorces, births of children, deaths of loved ones, etc.—weren't being shown by any of these techniques. I tested other methods such as solar arcs in longitude (which are very popular at present) but I never could get them to work very well.

At length I turned to primary directions, and there I encountered such a morass of confusion that I would have abandoned them without a backward glance except for the disconcerting fact that they worked. This is not to say that they work infallibly in every case—far from it! There are some horoscopes in which they don't work at all, and even when they do work well, you can still expect failure perhaps a quarter or third of the time. But when they do work, they enable you to pick up outstanding life events not shown any other way, and they enable you to do some very accurate rectifications.

In this article I will discuss primary directions to the angles, *i.e.* conjunctions and oppositions to the Ascendant and Midheaven. The concept behind primary directions is that, in the hours after birth, the diurnal rotation of the celestial sphere brings the planets successively to the eastern horizon, upper meridian, western horizon and lower meridian. The space in time between the moment of birth and the moment of rising, culmination, setting or lower culmination of a planetary body, converted to years of life at the rate of approximately 4 minutes of Sidereal Time to a year of life, yields a prediction which usually corresponds to a major life event consonant with the symbolism of the planet involved. Conversely, working backwards from a list of major life events, it is often possible to rectify an uncertain birth time to within a few seconds. For example, it is uncanny how the deaths of the two parents identified with malefic planets conjunct angles—often rectify back to the precise same instant of birthtime (unfortunately this doesn't occur in every nativity; when it does occur, it's more likely to occur in the horoscope of the eldest child).

Now the calculations involved in directing planets to the angles are straightforward. However, when you begin to consider the question of directing planets to one another, then things start getting messy.

In an interplanetary primary direction, one planet (termed the *promissor*) is conceived of as moving by the rotation of the celestial sphere along its diurnal circle until it reaches the position originally occupied by another planet (termed the *significator*) in the birth horoscope. For example; If Mars in the natal horo-scope lies on the 1st house cusp, then in something like 2 hrs. Mars (the promissor) by primary direction will conjoin natal Saturn (the significator). The arc of direction of this primary direction is 2 hrs (of time), or 30°(of arc), and will operate in the native's life when he is about 30 years old. (There are several different theories extant on how arcs of direction should be equated to time, but they are all in the neighborhood of 4 minutes of Sidereal Time- or one degree of right ascension over the Midheaven equals one year of actual life.)

Now as long as the significator is defined by a great circle (such as the Ascendant or Midheaven, which are the points where the ecliptic intersects the horizon or meridian, respectively), then it is a simple matter to determine how much time elapses between the moment of birth and the moment when a given promissor conjoins that significator (crosses that great circle). For example, if Saturn lies on the natal 12th house cusp, then the arc of direction of Saturn conjunct MC equals the Sidereal Time (ST) when Saturn culminates (crosses the meridian) minus the ST of birth. In this example the arc of direction will be about 4 hours (or 60 degrees), corresponding to about age 60.

Similarly, the arc of direction of a body conjunct the Ascendant equals the Sidereal Time when that body rises (crosses the eastern horizon) minus the ST of birth. However, if the significator is not defined by a great circle—that is to say, if the significator is merely a point body—then it is not so clear-cut precisely when a promissor will conjoin it. In our example of Mars moving by

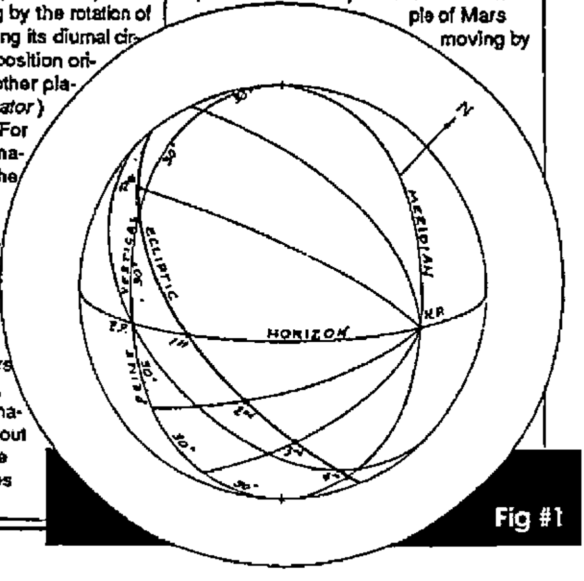

Fig #1

and Saturn lies on the 12th cusp

diurnal rotation until it reaches the position occupied by natal Saturn, we are faced with the question of defining precisely what we mean by *"the position occupied by natal Saturn."*

If Mars and Saturn should have the exact same declinations, which implies that they lie upon the same diurnal circle, then there is no problem: for at some time after birth (namely the ST when Mars culminates minus the ST when Saturn culminates) Mars will indubitably arrive at the precise spot in the heavens which Saturn occupied at birth.

However, if Mars and Saturn have different declinations and hence lie upon different diurnal circles, Mars will never arrive at the precise spot which Saturn occupied (since they travel along different parallel circles).

Therefore, we need a more generalized definition of "conjunction" before we can speak of directing planets and points to one another (as opposed to directing them to great circles such as the meridian or horizon).

It turns out that there is no single way of defining *conjunction*, but in fact every house system implies its own definition of what is meant by the term "conjunction," and every house system gives rise to its own unique method of computing primary directions. *(It's also true that, by the same logic, every house system gives rise to its own unique method of computing Arabian Parts and astrolocality maps a well. But this need not concern us here.)*

There are basically two types of house systems: projection systems and non-projection systems. Since *every* house system in common usage (except for Placidus) is a projection house system, we'll describe how conjunctions are defined in projection systems first.

In a projection house system, some circle is divided into twelve arcs. Usually these twelve arcs are of equal measure (namely 30 degrees). But in some systems (*e.g.* Porphyry, Alcabitius and Koch), arcs which lie in different quadrants can have different measures. In any event, opposite pairs of these 12 division points are joined by six great circles, termed *projection circles.* **The 12 points where these six projection circles intersect the ecliptic, define the longitudes of the 12 house cusps.**

Let's look at some examples:

Campanus: *(Figure 1)* In the Campanus system the *prime vertical* is divided into twelve 30 degree arcs, and the division points are projected onto the ecliptic with *house circles.* House circles are great circles which pass through the North and South points on the horizon.

Regiomontanus: *(Figure 2)* In the Regiomontanus system the *celestial equator* is divided into twelve 30 degree arcs, and the division points are projected onto the ecliptic with house circles.

Horizontal: *(Figure 3)* In the Horizontal system the *horizon* is divided into twelve 30° arcs, and the division points are projected onto the ecliptic with *vertical circles.* Vertical circles are great circles which pass through the zenith and nadir.

Meridian: *(Figure 4)* In the Meridian system the *celestial equator* is divided into twelve 30 degree arcs, and the division points are projected onto the ecliptic with *hour circles.* Hour circles are great circles which pass through the North and South celestial poles, (*i.e.*, are perpendicular to the equator).

Morinus: *(Figure 5)* In the Morinus system the *celestial equator* is divided into twelve 30 degree arcs, and the division points are projected onto the ecliptic with *longitude circles.* Longitude circles are great circles which pass through the North and South ecliptic poles (*i.e.*, are perpendicular to the ecliptic).

Equal: In the Equal House system the

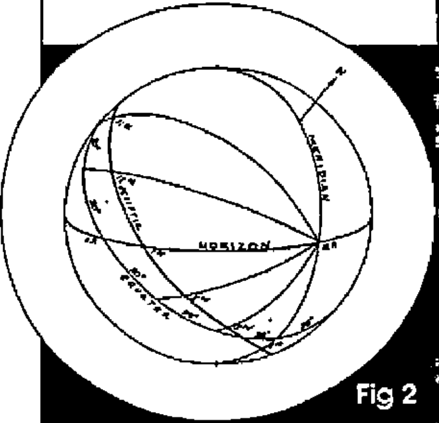

Fig 2

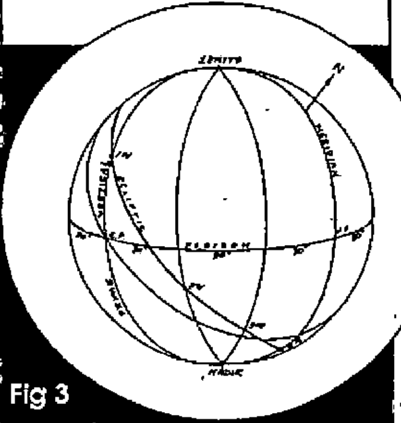

Fig 3

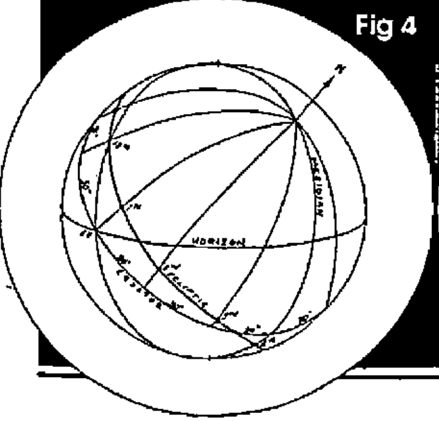

Fig 4

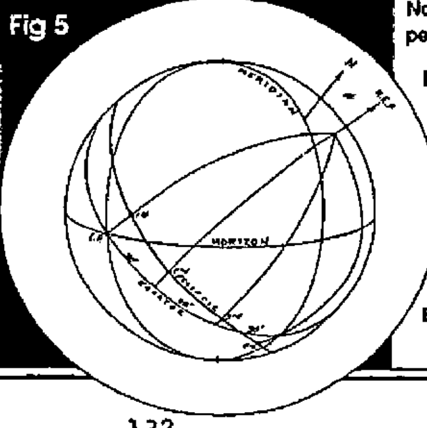

Fig 5

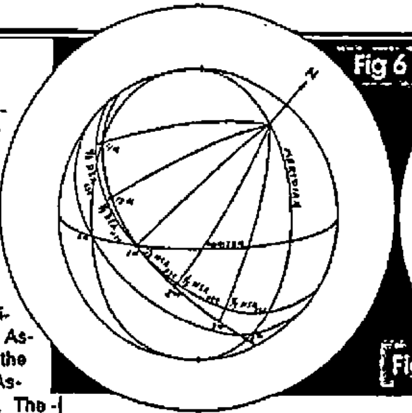

Fig 6

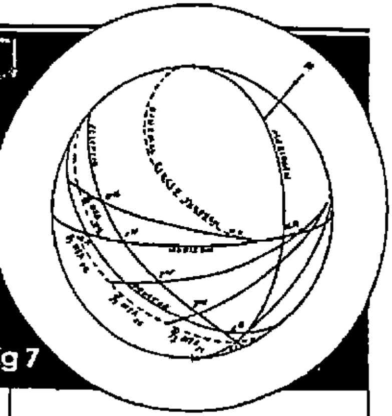

Fig 7

ecliptic is divided into twelve 30 degree arcs. You can project with any circles you like.

Porphyry: In the Porphyry system *the ecliptic is trisected in each quadrant.* Again, you can project with any circle you want.

Alcabitius: *(Figure 6)* In the Alcabitius system the *diurnal circle* of the Ascendant (the small circle parallel to the equator which passes through the Ascendant) is divided into twelve arcs. The portion of this diurnal circle lying in each quadrant is trisected. (The diurnal semiarc, or DSA, is the portion of the *diurnal* circle lying in the 4th quadrant. The *nocturnal* semiarc, or NSA, is the portion of the diurnal circle lying in the 1st quadrant). These trisection points are projected onto the ecliptic with hour circles.

Koch: *(Figure 7)* In the Koch system the *diurnal circle of the Midheaven* (the DSA of the MC) is trisected in the 4th quadrant; and the *diurnal circle of the lower meridian* (the NSA of the IC) is trisected in the 1st quadrant. Then these trisection points are projected onto the ecliptic with *ascension circles.* **Ascension circles are great circles tangent to the diurnal circles through the North and South points on the horizon.** Every point on the celestial sphere with declination less than the colatitude of the birthplace lies on two ascension circles: the horizon circle at the moment the point rises, and the horizon circle at the moment the point sets.

Topocentric: *(Figure 8)*

Here the celestial equator is divided into twelve 30 degree arcs, and the division points are projected onto the ecliptic with ascension circles for *pseudo-latitudes* (called "poles") which depend upon the house in question.

In a projection house system, two points will be defined to be conjunct if they lie upon the same projection circle.

For example: in the Campanus and Regiomontanus systems, two points are considered conjunct if they lie on the same house circle *(hence conjunctions and oppositions are the same in both of these systems, although other mundane aspects are different– as we shall see later on).* Similarly, in the Horizontal system, two points are considered conjunct if they lie upon the same *vertical* circle. In the Meridian and Alcabitius systems, two points are considered conjunct if they lie upon the same *hour* circle, *etc.*

Now we are in a position to define mundane conjunctions. The arc of direction of a *promissor* (P), directed to conjunction with a *significator* (S), is equal to the Sidereal Time when the *promissor* (by diurnal rotation) crosses the projection circle passing through the *significator, minus* the ST of birth.

More formally stated:
The arc of direction of *P* conjunct *S* equals the Right Ascension (RA) of *P* minus the RA of the point of intersection of the diurnal circle of *P* with the projection circle passing through *S*. Naturally, the value of the arc of direction of P conjunct S will be different for different house systems. Thus it would seem that at long last we have a quantitative method of resolving the domification question. By comparing predictions obtained from primary directions in different house systems with lists of actual life events, we can decide for once and for all which house system works best!

Ha, ha. April Fool. Actually, although it would *seem* that this is the case, the actual picture is somewhat blurry. We'll discuss this later on. Let's talk about mundane aspects first.

Having defined mundane conjunctions, we can now define other mundane aspects. To facilitate this definition, we will distinguish between two types of projection house systems: **natural systems** (*e.g.* Campanus, Regiomontanus, Horizontal, Meridian, Morinus, Equal) and **artificial** (*e.g.* Porphyry, Alcabitius, Koch, Topocentric).

In a **natural** house system, the circle being divided into twelve is a *great circle,* and it is divided into even 30° arcs. Observe that since the horizon and meridian are both house circles (but not both vertical, hour or ascension circles), only natural house systems that project with *house* circles (Campanus and Regiomontanus) can have *both* the Ascendant and Midheaven as *house cusps.* The Horizontal and Meridian systems preserve the MC as a house cusp, but not the Ascendant (since the Meridian is a vertical circle and an hour circle, but the horizon is not). The Equal House system (the way it's usually defined), preserves the Ascendant but not the MC. In the Morinus system, *neither* the Ascendant nor the MC appear as house cusps (since neither the horizon nor meridian are longitude circles).

In a natural projection house system the position of a *point* (such as a planet or an aspect location for a planet), is projected onto the circle being divided into twelve equal parts. Aspects are measured also on this circle from the projection point. *For example:* in the Campanus system, a point's position is projected onto the prime vertical by the house circle through it, and aspects are measured along the prime vertical from the projection point. In the Regiomontanus system, a point's position is projected onto the celestial equator by the house circle through it, and aspects are measured along the equator from the projection point. Two points are considered to be in mundane aspect if the arc measured along the circle being divided into twelve, from the intersection with the projection circle passing through the first point, to the intersection with the projection circle passing through the second point, equals the value of the aspect (60, 90, 120 or whatever). Note that mundane aspects are different even in systems (such as Campanus and Regiomontanus) in which mundane conjunctions coincide.

An artificial (as opposed to natural) projection house system is based upon a theory which would not normally yield both the Ascendant and Midheaven as house cusps. However, by adding a dash of fudge here and there in the theory—*Voila!*—you manage to pull both angles out as house cusps. *For example:* the Alcabitius system is a version of the Meridian system, modified (by dividing the diurnal circle of the Ascendant rather than the equator) to yield the Ascendant as a house cusp as well as the MC. An artificial projection house system is defined quadrant-by-quadrant; hence mundane aspects in these systems have to be defined quadrant-by-quadrant. Each quadrant is considered to contain 90° of mundane position (no matter how much of the circle being divided into twelve is actually contained in each quadrant). Aspects are figured by proportion between successive angles. *For example:* if the first quadrant (the 1st, 2nd and 3rd houses), contains 60° of the circle being divided into twelve, then a point located in the center of the quadrant is considered to be in semi-square (45 degrees) the 1st cusp– even though it is *actually* semi-sextile (30°) to it as measured along the circle being divided into twelve. *Understand?*

To direct a promissor to mundane aspect with a significator in *any* projection house system, a projection circle is passed through that point of the circle being divided into twelve which is in the given aspect with the significator. Then the arc of direction equals the Sidereal Time when the promissor, moving by diurnal rotation along its diurnal circle, crosses the projection circle through the aspect point, minus the ST of birth. *For example:* to direct a promissor to mundane sextile with a significator in the Campanus system, a house circle is passed through an aspect point 60° along the prime vertical from the intersection with the house circle through the significator. Then the promissor is directed to this house circle (through the aspect point).

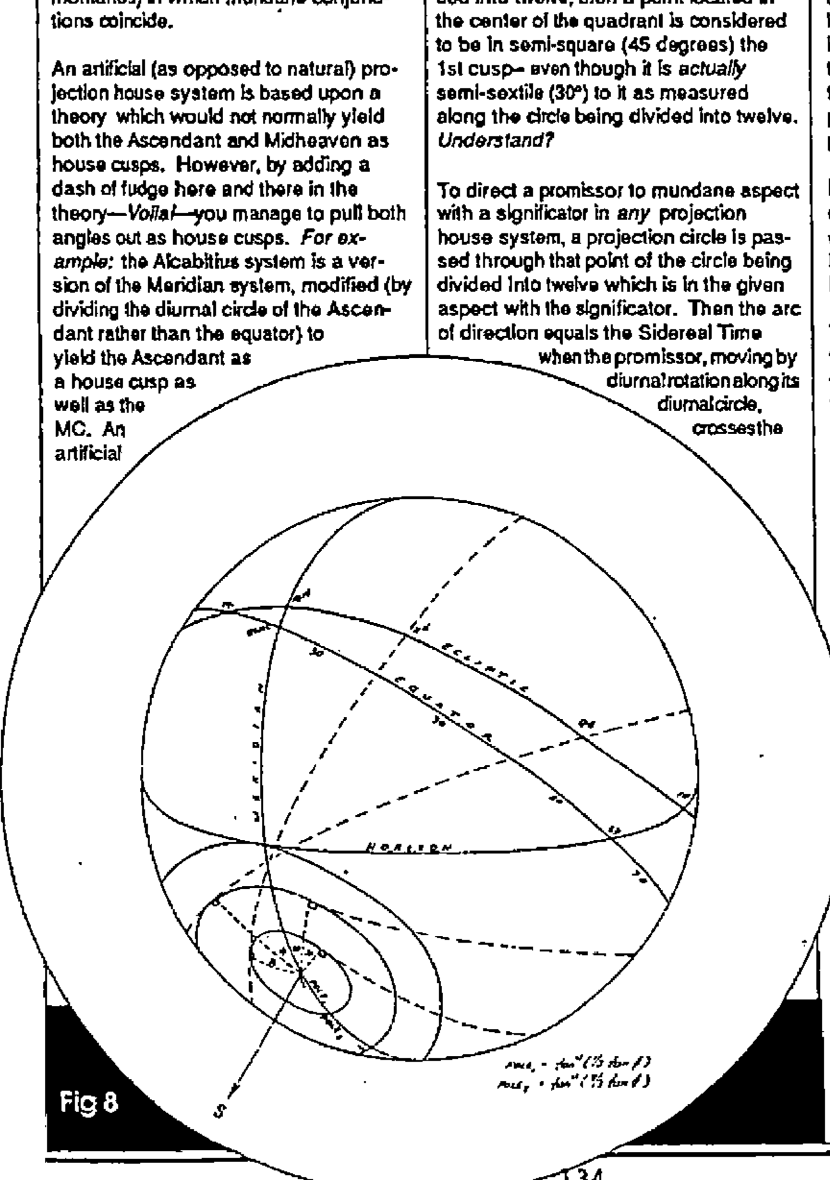

Fig 8

I hope this is all clear. The term "mundane aspect" is thrown around rather loosely in astrology. A *mundane aspect* is not the same thing as a paran; nor is it true (as devotees of the Campanus system would have you believe), that Campanus mundane ("mundoscope") aspects are the only kind that exist.

Having described, more or less, primary directions in projection house systems; we now turn to the only non-projection house system in existence, namely **Placidus.**

The *meridian distance* (MD) of a body is the arc to the meridian measured along the body's diurnal circle. It is equal to the Sidereal Time when the body crosses the meridian, minus the ST of birth, (*i.e.* it's the same as the arc of direction of the body directed to the meridian).

The ratio of a body's meridian distance to its semiarc (MD/SA), is a measure of how far the body has progressed through the quadrant in which it is located. *Example:* MD/SA = 0 when a body is on the meridian, and MD/SA = 1 when a body is on the horizon. The Placidus house cusps are those ecliptic points whose ratios of MD to SA equal 1/3 (3rd and 11th cusps) or 2/3 (2nd and 12th cusps).

Two points are considered to be conjunct in the Placidus system, if they lie in the same quadrant and have the same ratio of MD to SA. The set of points lying in the same quadrant which have the same MD/SA ratio is called a *proportional horizon.* It's a simple matter to show that a proportional horizon is *not* a great circle (or any other kind of circle) on the celestial sphere. Nonetheless, devotees of the Placidus system have- for several centuries– been blithely computing primary directions as if proportional horizons were great circles! Presumably this is why Placidians (such as DeLuce) use orbs of ± 2 years in their primary directions. There is, however, a correct way of computing Placidus primary directions, which appears in Alan Leo's *Progressed Horoscope* as well as in my own book. Having described all these different ways of computing primary directions, we are now ready for the $64 question: which house system yields the best correspondence between predictions and actual events?

I have tested only four different house systems (Campanus, Regiomontanus, Placidus and Meridian—which seem to me the most logical systems), and I've only tested them thoroughly in six horoscopes. I found that, apart from directions to the angles (which are the same in every house system), in no case was a significant correlation obtained between predictions and events. However, I did observe that while mundane conjunctions and oppositions in the Campanus and Regiomontanus systems (which are the same) didn't "work" in the sense of yielding life events deducible from the symbolism of the planets involved in the direction, nonetheless the pairs of events obtained by interchanging the promissor and significator were often related. Sometimes the two events or epochs in life were linked causally, *i.e.* the second was the direct result or outcome of the first. At other times there was merely a similarity of theme or tone. While this effect is of limited usefulness in predictive work, it does bear further inquiry. Obviously it needs a good deal more work.

Anyone who desires to delve more deeply into this topic is advised to read my book on primary directions, which contains all the formulas and algorithms you need to compute primary directions (in eleven house systems) in a step-by-step form, ready to program in your favorite language. It includes exhaustive explanations of what is going on and how the formulas are derived; with copious illustrations, example problems, fixed star tables and other relevant information. To obtain a copy of my book please send a check or M.O. (no cash) for $25 to

M.J. Makransky,
Apartado #36, Coban,
Alta Verapaz, Guatemala

...and I'll send you a photocopy of the manuscript.
Good luck!

ASTROLOCALITY MAPS

(Mercury Hour April 1991)

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OCTOBER, 1990

LONGITUDE CIRCLES IN ASTROLOCALITY MAPS

Edna M. Jones' letter (64th Ed., p.33) about locating planetson astrolocality maps prompted me to work out formulas for computing astrolocality maps using longitude circles rather than hour or ascension circles, as is done conventionally at present.

Hour circles and ascension circles are used to plot those locations on a map where a given planetary body was culminating or rising (respectively) at the moment of birth. While this is certainly the most logical way of measuring celestial sphere positions on the surface of the earth from a purely astronomical point of view, it is not necessarily the best way of doing it (albeit the simplest to calculate).

Indeed, there are cogent astrological arguments which can be made to support the measurement of terrestrial positions in terms of zodiacal longitude (using longitude circles) rather than in terms of right or oblique ascension (using hour or ascension circles). The use of longitude circles is congruent with the established corpus of astrological measurements, which are invariably carried out in longitude. Only in the theory of primary directions are right and oblique ascension used to any extent, and even there most practitioners employ zodiacal directions in preference to mundane directions (which are in fact the better model from the astronomical point of view).

The reason why zodiacal (rather than equatorial) measurement is used in astrology is precisely because it *is* more symbolical. As Marc Edmund Jones said, symbolism is more powerful than reality. We are not using astrological measurements to determine the mass, density, or physical characteristics of the planets; we're using them to learn something about our lives here on earth. We're involved in a symbolic enterprise, not some literal description of a mechanistic "reality". And our use of zodiacal measurement is a reminder of what we're about: It's a more powerful link to the channels of communication which we are seeking to tap into than is a literal astronomical model. When we plot points on an astrolocality map in zodiacal longitude, we are locating those places on the earth where the planetary energies resonate for us on a deep emotional level.

Every astrologer will have to discover what this means for himself, by using the technique; but no great flights of fancy are called for in validating the results. I have yet to see an exactly rectified horoscope that fails to yield at least one partile conjunction or opposition in longitude between a natal planet or angle in the horoscope, and a place on earth where the native has lived for any amount of time (indeed, most charts yield several such contacts). It is for this reason that the technique shows great promise as an aid to rectification.

However, in letting one's fancy fly freely, one can conjure up all sorts of zodiacal midpoints, fixed stars, nodes, etc., not to mention aspects in longitude, which impinge on any given place on earth where the native has lived or to which he may consider relocating.

My own case is rather typical - out of the five locations where I have resided for more than a year, three of them are within a degree of conjunction or opposition with a natal planet in my chart (the other two are within a degree of an important midpoint); and the only major journey I've taken (for three months to South America) was to a place within a degree of two natal planets:

PLACE	LONG	LAT	ZOD LONG	NATAL PLANET
College	72W41	41N46	4LE34	Mn4AQ38
Tragic Love	78W52	42N53	29CA27	VE29CA36
Uranian	122W50	38N27	25GE13	UR24GE37
Journey	76W16	1N53	12LE35	PL12LE50 SA11LE55

(The above values are based on a longitude of birthplace - 75W10 and an ST of birth - 8h 47m 4s).

Now I wasn't particularly happy at college, and in fact I never graduated, which neatly fits the "opposition Moon" symbolism. Perhaps had I chosen a college conjunct my well-aspected natal Jupiter or Mercury, my collegiate career would have had a very different outcome.

Since Venus is rather afflicted in my natal horoscope, the great tragic love affair of my life (and indeed the emotional nadir of my existence on earth to date) occurred in a place conjunct my Venus. Preliminary results with this technique suggest that in making elections (of places to relocate or vacation) it is necessary to consider the state of the natal planet which influences that place in terms of the aspects it makes in the radix, etc. rather than to blithely relocate to a place influenced by Venus or Jupiter in the naive hope that an afflicted natal planet (even if it is nominally a benefic) is ever going to bring any good into one's life.

I spent a tough but liberating year and a half - overworked, underpaid and under appreciated, and under great stress generally; but at the same time dynamic, disciplined, and with tremendous, mental clarity - in a place conjunct my natal Uranus.

The journey to South America (to visit an old college buddy who'd gone off to live alone in the jungle and was about 87% nuts by the time I arrived) was an intense and sobering experience; but it wasn't nearly as bad as I might have feared had I known beforehand that I was heading straight into the heart of my natal Saturn-Pluto conjunction.

There are two algorithms for computing zodiacal positions on the earth's surface. The first is a "Zodiacal Longitude of Place" algorithm, for computing the zodiacal position corresponding to any given point on the earth. The second is a "Point-Plotting Algorithm" for plotting longitude circles on a map.

ZODIACAL LONGITUDE OF PLACE ALGORITHM

In both this algorithm and the next one, it is first necessary to calculate the obliquity of the ecliptic (E) and the Absolute Longitude (LONG) of the place on earth for which the calculations are being carried out.

1) $E = 23.4523-.00013(Y-1900)$ where Y is the year of birth.

2) Let $RAMC = 15 \times ST$, where ST is the Sidereal Time of birth, expressed in hours and decimal fractions.

Let LB = terrestrial longitude of the birthplace west of Greenwich, expressed in degrees and decimal fractions. If the birthplace is east of Greenwich, let $LB = 360 -$ terrestrial longitude of birthplace east of Greenwich.

Let LP = terrestrial longitude of the place in question, expressed in degrees and decimal fractions. If the location is east of Greenwich, take LP to be a negative number. Then the Absolute Longitude of the place

$LONG = RAMC + LB - LP$

If $LONG < 0$, then add 360 to it;

If $LONG > 360$, then subtract 360 from it.

```
3)  Given the Absolute Longitude (LONG) and terrestrial latitude
    (LAT) of a place on earth, to compute its Zodiacal Longitude
    (ZL) – (consider that $LAT > 0$ if north, and $LAT < 0$ if south
    of the equator):
    Let $Y = \text{Arctan}(\tan LAT \sin E)$
    If $LONG = 0$, then if $LAT \geq 0$, then $ZL = Y$ and
                        if $LAT < 0$, then $ZL = 360 + Y$
    If $LONG = 90$, then $ZL = 90$
    If $LONG = 180$, then $ZL = 180 - Y$
    If $LONG = 270$, then $ZL = 270$.
4)  If $LONG \neq 0, 90, 180$, or $270$, then
    Let $H = \text{Arccos}(\cos LONG \cos LAT)$
    Let $M = |E - \text{Arctan}(\tan LAT / \sin LONG)|$
    Let $X = \text{Arctan}(\cos M \tan H)$.  Then,
    If $0 < LONG < 90$, then if $M \leq 90$, then $ZL = X$ and
                           if $M > 90$, then $ZL = X + 360$
    If $90 < LONG < 180$, then $ZL = 180 + X$
    If $180 < LONG < 270$, then $ZL = 180 - X$
    If $270 < LONG < 360$, then if $M \leq 90$, then $ZL = 360 - X$ and
                              if $M > 90$, then $ZL = -X$.
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POINT - PLOTTING ALGORITHM

This algorithm is used to plot longitude circles on astrolocality maps. Given a Zodiacal Longitude (ZL) and a meridian of terrestrial longitude (converted to Absolute Longitude, LONG), to compute the terrestrial latitude (LAT) at which that longitude circle intersects that meridian:

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1)  If $LONG = 90$ or $270$, then LAT is indeterminate since the
    longitude circle coincides with the meridian of place.
2)  If $LONG \neq 90$ or $270$, then
    Let $A = \text{Arctan}(\sin LONG \tan E)$
    Let $B = \text{Arctan}(\tan LONG / \cos E)$
    Let $C = \text{Arctan}(\tan(ZL - B) / (\cos LONG \sin E))$.
    $LAT = A + C$.
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(Mercury Hour April 1992)

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SEPTEMBER, 1991

VARIANT FORMS OF ASTROLOCALITY MAPPING

In an earlier article in MH (68/6) I discussed a way of projecting a natal horoscope onto a world map using longitude circles, rather than hour or ascension circles (the conventional way of doing it at present). In this article we will look at some other possible projection methods, and discuss various pros and cons of each method.

In any projection scheme what we are doing is correlating points on the celestial sphere with points on earth. The center of the earth is (by definition) the center of the celestial sphere; and every ray emanating from the center of the earth intersects the surface of the earth at a certain point, and then goes on to intersect the sky (celestial sphere) at a certain point; and these two intersection points (surface of earth and sky) are then correlated. Another way of saying this is, a point of the celestial sphere correlates with that point on the earth at which it's on the zenith (directly overhead) at the moment of birth.

However, since the planets' declinations can never get much beyond the value of the obliquity of the ecliptic (23°), the rays from the center of the earth to the individual planets cannot intersect the surface of the earth outside of the tropics. In other words, just to be able to determine that (for example) Mars was on the zenith at Timbuktu at the moment we were born is not going to be very helpful. We need a line (actually a great circle on the earth) which passes through Timbuktu to map out our "Mars power zone"; and there are as many ways of putting a line through Timbuktu as there are house systems. Bear in mind, however, that only at Timbuktu (or wherever Mars was on the zenith at the moment of birth) are we unequivocally under the influence of Mars - elsewhere we are only under the influence of somebody's definition of the term "conjunct Mars".

In Astro*Carto*Graphy there are two sets of projection circles used - hour circles and ascension circles - which correspond to the cusps of the Meridian and Koch house systems. Therefore, from here on in, we will refer to this method of mapping celestial sphere positions onto the earth as the "Meridian-Koch" method.

The Meridian Mars line in this method is the great circle joining Timbuktu (in our example) with the north and south poles of the earth; i.e. it's the locus of places on earth for which Mars was on the Meridian at the moment of birth (the places due north and south of Timbuktu).

The Koch Mars line in this method is the great circle for which Timbuktu is the *pole*; i.e., it doesn't pass through Timbuktu, but rather is everywhere located 90° away from Timbuktu (it's the locus of places on earth halfway around the globe from Timbuktu).

The Koch and Meridian lines, taken together, can be considered the "angles" - i.e. they are the places on earth where the planets were on the angles at the moment of birth. This is a sensible way of doing the calculations from a purely astronomical point of view, and also a sensible way from an astrological point of view (since we have a body of accumulated astrological lore describing the symbolism of angularity).

In the previous article in M.H., astrolocality maps plotted with longitude circles were described. This will hereinafter be termed the "Morinus" method. The Morinus Mars line passes through Timbuktu and the point on the earth which correlates with the north ecliptic pole. The north ecliptic pole is located on the 270° (zero Capricorn) meridian for the moment of birth, at a terrestrial latitude of 90 minus obliquity (about 67° north). This point is not fixed, but sweeps around the 67th parallel in the course of a day. Thus the Morinus Mars power line is the locus of the places on earth on a straight line between Timbuktu and the ecliptic pole (at the moment of birth). These are the places on earth which are conjunct Mars in longitude (as opposed to RA or OA).

The Morinus method is not as good an astronomical model as the Meridian-Koch method; but it is arguably a better astrological model. If all we were interested in were the positions on earth which are conjunct or opposition Mars, then the Meridian-Koch method might be superior. But since we want to be able to take aspects in this system (not just look at our Mars power line, but also look at our trine Mars power lines, our square Mars power lines, etc.), the Morinus system is better, because we already have an accumulated body of knowledge relating to aspects in longitude - we know that aspects in longitude "work" whereas there's no general consensus on the value of aspects measured in RA or OA (i.e. the Meridian or Koch measures). Although the ancients certainly knew about RA and OA, they didn't take aspects in these measures; so there's no precedent for us to do so either.

Indeed, this has been borne out in my own experience. The Meridian and Koch conjunction and opposition lines *do* often pass through places significant to the native; but I've not found Meridian-Koch aspect lines to be of much value (whereas I've found Morinus aspect lines to be very effective in practice).

Sometimes the two methods are in very good agreement: for example, a place where I experienced a very unhappy love affair lies within 7' of arc of my Meridian opposition Moon line, and within 9' of arc of my Morinus conjunct Venus line (Venus is afflicted in my natal chart). The two lines happen to cross just outside of town (had I known that in advance I wouldn't have set foot near the place).

At other times the two methods contradict: for example, the place where I was born and raised is within a degree of my Meridian Sun line (I was born 10 minutes past noon), and also within a degree of my Morinus square ASC line. And while I like the place where I was born, and take a certain amount of pride in the town, I can't say I was very successful there. On the contrary, I was very unhappy.

There are other possible projections of celestial sphere positions onto the earth which can also be carried out.

In the Horizontal (Local Space) method we project with vertical circles: our Mars power line passes through Timbuktu (where Mars was on the zenith at the moment of birth in our example), and the place of birth; i.e. it's the locus of places on earth on a straight line between Timbuktu and the birthplace.

Here is where the basic problem with Local Space charts comes up: what to do when the native relocates from the birthplace. In the Meridian-Koch and Morinus projections, the power lines are fixed at birth for all time, and everyone born at the exact same moment anywhere on earth will have identical planetary power lines. But in the Horizontal method (and also in the Campanus method, as we shall see) two people can have identical power lines only if they were born at the exact same moment and exact same place. So when a native moves from his birthplace, what does he take with him?

Practitioners of Local Space charts argue that he takes the cardinal directions with him, e.g. if Mars (Timbuktu) was due southeast at the moment of birth, then southeast is considered the Mars direction from then on, no matter where on earth the native moves to. But if he moves to Timbuktu Estates (a housing development, due southeast of Timbuktu), a Local Space chart relocated to this new location will show Mars 180° in the opposite direction from where it ought to be.

In other words, are we to face east, or Mecca? Advocates of Local Space charts say, face east; but theoretical considerations seem to demand that we face Mecca. That is, no matter where we are, our Mars power line must move with us; it is the line that joins Timbuktu and the place we are standing right this minute.

But in that case, why Timbuktu? If we're relating all positions to where we are right this minute, then why not use the direction Mars is in right now as our other point of reference, rather than Timbuktu (where Mars was when we were born)? In any case, this illustrates some of the theoretical problems which the use of any vertical circle (Local Space chart) projection pose.

The same problem comes up in a Campanus projection. Here we first locate the north point on the horizon - the point whose terrestrial longitude equals the longitude of the birthplace (if birthplace is south of the equator), or which equals 180 + the longitude of the birthplace (if birthplace is north of the equator), and whose terrestrial latitude equals 90 minus the birthplace latitude. A great circle which passes through Timbuktu and this point is our Campanus Mars power line. As in the case of the Horizontal projection, we are faced with the same unhappy choices once a native moves away from his birthplace: to leave all the power lines pointing at a place where the native is no longer located; to move the "cardinal directions" along with the native irrespective of the actual cardinal directions at his new location; or to keep the thing in constant flux as both the native and the planets move.

In the Placidus projection, the Mars power line passes through Timbuktu and the north point on the horizon (as in the Campanus method); however in this case the line is not a great circle on the earth (Placidus is the only system in which power lines are not great circles). Thus a Placidus projection would have all the same drawbacks as a Horizontal or Campanus projection, and be much more difficult to calculate in the bargain.

Therefore, on theoretical grounds, the Horizontal (Local Space), Campanus, and Placidus methods are inferior to the Meridian-Koch and Morinus methods because 1.) there is no accumulated body of astrological lore which supports measurements based on these projections (aspects are not historically taken in azimuth or zenith distance, and 2.) these systems are local rather than universal, and therefore create problems of definition once the native relocates from his birthplace. For this reason it would not appear that these latter projections would be particularly fruitful lines of investigation.

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MURRAY J. MAKRANSKY
GUATEMALA
MAY, 1990

A CRITIQUE OF THE KOCH HOUSE SYSTEM

The Koch ("Birthplace") House System has gained a good deal of popularity in recent years, and a number of interesting claims have been made for its efficacy in natal and predictive work.

Nonetheless, the mathematical formulation of the Koch System is severely flawed. Indeed, of the dozen or so house systems in existence, some are interesting; some are silly; but only one is out-and-out wrong - and that one is the Koch System.

The problem lies in the fact that the definition of the Koch System is ambiguous in that it is not always possible to determine in which house a planet should be placed. The houses flanking the meridian "overlap" each other in such a way that it's possible for a planet to be in two houses at the same time!

The reason this comes about is as follows:

The basic assumption underlying the Koch System is that the cusps of the houses should be horizon circles; i.e., points which all rise in the east at the same time. The 1st house cusp should be the horizon circle at the moment of birth (so that the Ascendant is still the Ascendant); and the other house cusps should be the horizon circles 2, 4, 6, 8 etc. hours after birth (e.g. the 2nd house cusp is the Ascendant at Birth + 2 hours, the 3rd house cusp is the Ascendant at Birth + 4 hours, etc.)

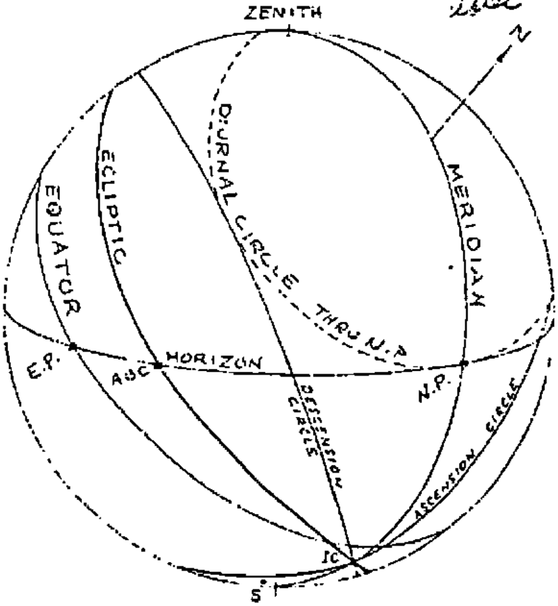
This is the logical way of defining a house system based on the concept of equal ascension: that two points which rise in the east at the same time are considered to stay together all the way around the chart. Or another way of saying it is, if point B rises in the east later than point A does, then point B lies later in the houses (further along, or in a later house) than A.

However, if you define house cusps this way, the 4th house cusp can no longer be the IC, the 7th can no longer be the Descendant, and the 10th can no longer be the MC In other words, you lose all the angles except the Ascendant.

Therefore, the inventor of the Koch System had to modify his original concept of equal ascension so as to be able to preserve the IC, Descendant, and MC as house cusps.

One modification was introduced into the model to preserve the MC and IC This involved making the intervals between cuspal horizon circles greater than or less than 2 hours, as need be, to insure that the MC and IC pop out when they're supposed to. This modification of the original concept, whatever its merits, is innocuous and is not the cause of the problem.

The problem arises from the fact that in order to preserve the Descendant as a house cusp, the house cusps on the western side of the meridian were modified to be descending rather than ascending horizon circles; i.e., the house cusps on the western side of the chart consist of points which set (rather than rise) at the same time. Or, another way of saying this is, on the western side of the chart, if a point B sets in the west later than point A does, then B lies later in the houses than A.



Although this modification might seem logical and reasonable at first glance, it has unfortunate consequences. Look at the figure, which shows the celestial sphere (from the outside). The IC (4th house cusp) is the point of intersection of the meridian and the ecliptic (zodiac circle).

The line labeled "Ascension circle" is the ascending horizon circle which passes through the IC The points on this line rise in the east at the same time the IC does; the points to the left (east) of this line rise before the IC does; and the points to the right (west) of this line rise after the IC does.

Similarly, the line labeled "Descension circle" is the descending horizon circle that passes through the IC the points on this line set the west together with the IC; the points to the left of it set before the IC; and the points to the right of it set after the IC.

Now consider a point S which lies south of the IC, between these two lines. Since S lies east of the meridian, we measure its house position with ascending horizon circles; and since it lies to the right (west) of the Ascension circle through the IC, it must rise in the east after the IC does. Therefore it must lie later in the houses than the IC - i.e. it must be in the 4th house.

However, if it is in the 4th house, it must set in the west later than the IC does (since the 4th house is defined to consist of points which set after the IC does). But as the figure indicates, S lies to the left of the Descension circle through the IC, and therefore it must set in the west before the IC does - that is to say, it must be in the 3rd house.

This area of "house overlap" is by no means a trivial problem; all that is required of a planet to fall into this "gray zone" is that it have south celestial latitude and lie near the IC, or that it have north celestial latitude and lie near the MC It is no rare occurrence for a chart to have planets which cannot be placed in the scheme of Koch houses.

In practice this problem is solved by papering over it, and locating planets in whichever house their degrees of longitude fall. However, when you delve deeper into the Koch System and try computing Koch primary directions or Koch "Method of the Ancients" Arabian parts, then you will find glaring contradictions which cannot be satisfactorily resolved.

Therefore, if you are using the Koch System and getting good results from it, then so be it. If you're a good intuitive astrologer you can get good results from anything. But if you're using the Koch System merely because you don't know any better; or because it's the latest "in" thing, then maybe you ought to think it over a bit more.

Any reader who wishes to examine this problem in all its mathematical detail, or who wishes to understand more clearly the mathematics of the celestial sphere and house division, is advised to read my book on Primary Directions (available for $25 check or M.O. from: Dear Brutus Press, Apartado #36, Coban, Alta Verapaz 16901, Guatemala).

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GUY dePENGUERN
PARIS, FRANCE
JANUARY, 1991

Answer to M. J. Makransky, in Guatemala: about the Koch System of Houses: either you are a very inefficient astrologer, or not a good teacher in mathematics, or a very "behind your time" astrologer,...since, WHO still uses Primary Directions(???), I know MUCH better, obviously, than YOU do, and I have been using KOCH in MEDICAL work, saving several dozens of peoples LIVES...because KOCH works ALL the Time, on EACH CHART, IF one knows some astro-medicine, which, obviously, YOU don't..So, dear Mr. M.J. Makransky, you should write ONLY about what you know..! And I will NOT waste any more of my time answering your gibberish about Koch's System: it is wonderful, and, again, helps me, or other SERIOUS astrologers, in their excellent work...

M. J. MAKRANSKY
GUATEMALA
JUNE, 1991

FURTHER CRITIQUE OF THE KOCH HOUSE SYSTEM

To Guy dePenguern (23/X/37): Thank you for your appreciative remarks about my first article on the Koch house system. Your interest in this subject has inspired me to embellish upon the theme and discuss further flaws in the mathematical formulation of the Koch house system, which I neglected to mention in my first article on the subject. In this issue we will briefly survey (in a non-technical manner) the basic problem of house division theory, and next issue we will discuss flaws specific to the Koch house system.

The problem of house division arises from the fact that a house system is an attempt to represent a three-dimensional situation in two dimensions. A house system isn't a pie, but rather a tangerine; the divisions between wedges aren't lines, but planes. The problem of house division lies in the fact that certain information which makes sense from a three-dimensional point of view becomes highly distorted when squeezed into two dimensions.

Ideally, a house system should fulfill two conditions:

1) It should model the earth's rotation. I.E., the diurnal motion of a planet should be constant - it shouldn't take more time to pass through some houses than others.

2) It should preserve the ASC, MC, DESC, and IC as house cusps. Another way of saying this is: both the horizon and meridian planes should delimit segments of the tangerine. We can only "see" the ASC as a cusp if we are "sighting down" the horizon plane (if our viewpoint lies on the plane of the horizon); and we can only see the MC as a cusp if we are sighting down the meridian plane (if our viewpoint lies on the plane of the meridian). Therefore, we can only see both the ASC and MC at once if both the horizon and meridian planes delimit segments of the tangerine.

The basic problem of house division theory lies in the fact that these two conditions contradict each other; and all the different house systems known to man represent different people's ideas of how to resolve that contradiction.

In fact, there is no way to resolve this contradiction (it is mathematically impossible to resolve it). The claim made in the introduction to ASI's Birthplace Tables of Houses that Koch "at long last succeeded in solving the astronomical problem of house division" is on a par with claims that have been made for a squaring of the circle. In practice what different house systems do is either ignore condition 1), ignore condition 2), ignore both conditions, or make a pretense of satisfying both conditions and end up satisfying neither of them.

Consider condition 1). In order for a house system to model the earth's rotation, the axis of the tangerine must be the earth's axis, and our point of view must lie on it. We squash the tangerine into the plane of the equator (or some plane parallel to it). We are looking down from the viewpoint of the north celestial pole, so our viewpoint is stationary, and everything else rotates around us (at a constant rate). This is how the Meridian and Alcabitius systems are defined. The Meridian system is a perfect model of rotation; in Alcabitius, a body's rotation is constant east of the meridian, but at the meridian it "jumps the tracks" and rotates at a different constant rate west of the meridian. As we shall see later on, there is a similar discontinuity in rotation in the Koch system, except at the horizon. That is, in Koch, a planet passes through the houses above the horizon at a different speed than it passes through the houses below the horizon.

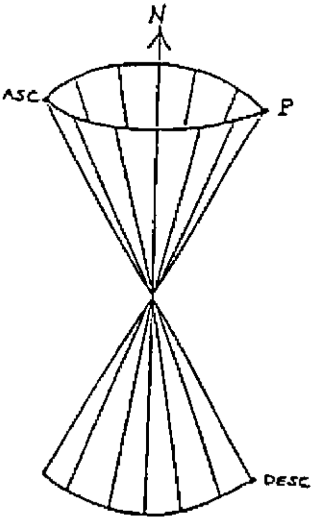

Figure 1: Koch System

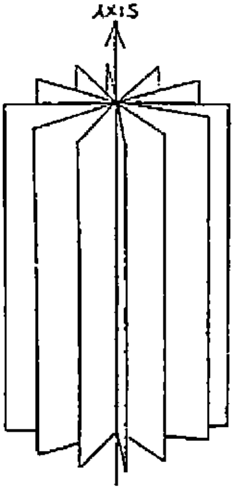

Figure 1: Other House Systems

The Campanus, Regiomontanus, Solar, Horizontal, and Porphyry systems make no pretense of fulfilling condition 1), and they are not good models of rotation. This is because the tangerine axes in these systems are not the earth's axis, and therefore as the world turns these models "wobble" (rotate at varying rates rather than smoothly at a constant rate). In these systems our point of view is not stationary, but is itself rotating around the earth's axis.

The Placidus system doesn't wobble per se because of a rather elegant geometrical trick: Placidus is the only house system in which the segments of the tangerine are not delimited by planes, but rather by curves. The edges of the tangerine segments are not flat, but have a wave to them, like potato chips. Because our line of sight along these edges "bends", it is possible to maintain a fix on both the ASC and MC at the same time. However, Placidus has the same rotational flaw as Koch: rotation is constant above the horizon, and rotation is constant below the horizon, but as a body crosses the horizon it either hits the accelerator or slams on the brakes.

Now, just as the first condition (that rotation be smooth and constant) requires that our viewpoint be looking down from the north celestial pole, so too does the second condition (that the angles be cusps) require that our point of view be looking south from the north point on the horizon. In other words, condition 1) implies that the axis of the tangerine is the earth's axis, and condition 2) implies that the axis of the tangerine is the line formed by the intersection of the horizon and meridian planes. That's why the two conditions contradict; each one requires a different point of reference.

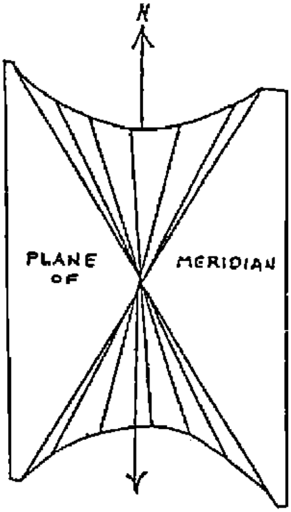

Figure 2: Split cone

the Equal House and Morinus systems resolve the problem by ignoring both conditions. In these systems the axis of the tangerine is the line joining the poles of the ecliptic (our point of view is the north ecliptic pole), so not only does the tangerine wobble, but also we can't sight down either the horizon or meridian planes in these systems because our point of view (the ecliptic pole), doesn't lie on either of these planes. The Equal House and Morinus systems, for these reasons, seem somewhat shameless in their pretensions to be considered house systems at all.

Only from the point of view of the north point of the horizon (squashing the tangerine into the plane of the prime vertical), where we can sight down both the horizon and meridian planes, can the ASC and MC be observed simultaneously. This is the viewpoint taken in the Campanus, Regiomontanus, and Solar House systems, and only these systems perfectly fulfill condition 2) (while ignoring condition 1)).

Some house systems ignore condition 2) altogether. For example, the ASC is not a cusp in the Meridian and Horizontal systems. Other house systems use some sort of trick or gizmo to pull both angles in as cusps.

The Porphyry system has a bit more shame than Equal House, but not much. It wobbles just as bad, but at least lip service is paid to preserving both angles. However the Porphyry system gives up on geometry, and solves the problem by waving a magic wand and pulling the MC out of a hat.

Finally we come to the Koch system. In the previous article on the Koch system, it was shown that the Koch system (and only the Koch system) fails as a house system because the houses flanking the meridian "overlap" each other in such a way that it's quite possible for a planet to be in two houses at once. This is because the way in which the Koch system is defined only "works" unequivocally for points (such as the Sun) which lie exactly on the ecliptic. If a planet has latitude north of the ecliptic, then at a certain moment while the body is passing through the 10th house it will suddenly appear simultaneously in the 9th house; and if the planet has south latitude, then at some moment while it is passing through the 4th house it will suddenly appear simultaneously in the 3rd. That the formulation of the Koch house system is absurd is not a personal opinion; it is a mathematically demonstrable fact.

However, it is not the absurdity of the Koch system which concerns us here, but rather its inelegance. The Koch system is the only house system in which our tangerine lacks a central axis. The planes which divide segments of the tangerine are tilted, so instead of intersecting in a line they intersect in a point (at the center of the tangerine), forming a double cone (see figure 1A in Jan. '92, 71st edition) Note in the figure that the Koch house cusps are not the planes which intersect the double cone at the lines, but rather are the planes which are tangent to the double cone at these lines (i.e. they delimit the double cone). Our viewpoint in the Koch system is the center of the tangerine - the point where all planes (lines of sight) meet.

If left to itself, this double cone would rotate smoothly around the earth's axis (and hence be a perfect model of rotation, as the Meridian system is). Unfortunately what happens is that because all other house systems take a viewpoint located on the surface of the tangerine (the north celestial pole, north ecliptic pole, or north point on the horizon), we can "look down on" the whole tangerine at once. But if our point of view is the center of the tangerine, then we have to be looking either one way or the other - either up the double cone (north) or down it (south). We can't look both ways at once; so if we are looking at the ASC., we can never see the DESC. We can see the point P - the point on the double cone which lies directly across from the ASC. - but this point is not the DESC. (it has declination opposite to that of the DESC.).

Nor can we ever see the MC or IC, since the meridian plane is not tangent to the double cone (it cuts through it, see figure 2 Jan. '92, 71st edition) So the double cone had to be "split" at the meridian into two half-cones. Every time a body reaches the meridian, we have to shift our point of view from north to south (or the reverse) to keep it in sight. And at that precise instant, when we have to whirl around, we are able to steal a quick glance out to the side (down the meridian plane) and "see" the body transiting the meridian.

This is the basic problem with the Koch house system (apart from the logical contradictions it engenders) - it just doesn't make any sense. The Campanus, Regiomontanus, Solar, Meridian, Porphyry, Horizontal, and Morinus systems all make some kind of sense. There's a logic to them, flawed though it might be. Even the Placidus system makes sense at first glance (but falls apart under close scrutiny). In all these house systems there's a fixed point of view. We don't have to be jumping about and waving our arms and looking this way and that. We can just sit there peacefully and watch the thing rotate.

That's the real problem with the Koch house system - not that it's riddled with contradictions (which it is) - but rather that it's inelegant. It's squalid and ugly and made of patches on patches.

In the introduction to ASI's Birthplace Tables of Houses it says that in formulating his house system Koch "was assisted by some of the leading and most capable German and Austrian researchers in this field."

It's to be hoped that he didn't pay them too much.

GUATEMALA
JANUARY, 1992

THE LAST WORD ON THE KOCH HOUSE SYSTEM

(From me anyway)

To everyone except Guy dePenguern: I know you're all getting tired of hearing about the Koch House System; and indeed it would scarcely merit this much attention were it not such an outstanding example of how easily astrologers are duped - how their ignorance of mathematics and their hunger for the latest in hype can lead to the widespread acceptance and dissemination of a theory which is demonstrably a hoax. Since the original article was published plenty of Koch charts have appeared in the pages of MH, which shows how difficult it is to turn back the tide of error. So I'll make one more attempt to paint the picture for you all, and then remain silent evermore.

First of all it must be understood that mathematics is a descriptive tool. Of and by itself, mathematics is nothing; it only takes on meaning as there is some (non-mathematical) concept which it is describing (modeling). House system calculations, for example, aren't (or shouldn't be) just a bunch of sines and cosines strung together at random. They should model some geometrical concept (of how to divide the celestial sphere into slices), and then this geometrical model must be modeled algebraically (reduced to numbers).

Most astrological claims cannot be proven because the basic raw material of astrology is emotion, which doesn't easily lend itself to numerical measurement; although here and there statistical "proof" can be obtained for the validity of some astrological factor (as Gauquelin has shown). However, it more frequently happens that an astrological claim can be disproven (refuted by mathematical argument) when the geometrical or algebraic models on which the claim is based can be shown to be incorrectly formulated.

For example, it is a simple matter to demonstrate that the method of calculating primary directions described by Simmonite, Zadkiel, DeLuce, and J.A. Jones is mathematically incorrect; and that the correct way of calculating what they thought they were calculating can lead to differences of up to several years in the predictions. Therefore, when Simmonite talks about "...the arcs of direction, by which not only the nature of the events which shall befall the native may be foreseen, but also the period when they shall occur (to within a few days) may be undoubtedly ascertained."; we can be certain that he is wrong. Either he is mistaken, or else he is lying.

In the preceding articles (22/X/39 and 71/11) in this series we took a look at the house division question and some flaws specific to the Koch system. We won't repeat the whole thing again, but just summarize:

The Koch system has unique and interesting features, and is clearly the product of a vivid imagination. Koch took a bold stab at solving the house division problem, but he didn't know enough mathematics to realize that his solution was unsound. It was unsound because 1) the house division problem is mathematically insoluble; and 2) even if it wasn't insoluble the Koch system is incorrectly formulated.

It fails as a geometrical model because it is not continuous (does not have a fixed point of reference, but rather flickers back and forth from one viewpoint to another).

It fails as an algebraic model because the mapping of points from the celestial sphere onto the horoscope is not a function (it is possible for the same celestial sphere position to be mapped onto two distinct points in the horoscope).

En passant: Koch uses geocentric latitude rather than geographical latitude to compute house cusps in his system, which is also incorrect. Geographic latitude should be used in all celestial sphere calculations (see Dean, Recent Advances page 182). Basically Koch didn't miss a trick; anything he could have screwed up, he did screw up.

Now, if the validity of the Koch system was claimed to be based upon an empirical derivation from objective events with unverifiable data (which is the claim to fame of the Topocentric system); or if its validity rested upon messages from the spirit world (the Solar House system); or if it was authenticated by hoary antiquity (Equal House); then that would be one thing. In that case its validity would be irrefutable (or at least nonrefutable).

But no! The entire raison d'etre of the Koch system is its mathematical correctness: "With the solution at long last of the house division problem, a new era in the history of astrology may be said to have begun!" - intro. to ASI's Koch House Tables.

And the fact is, that to anyone conversant with high school trigonometry, the mathematical formulation of the Koch house system is a joke. It is absurd as an astronomical model, and the mathematics used to pull it together is full of holes. It's just a bunch of sines and cosines strung together at random.

An individual who uses the Koch system in his or her work can still get some satisfactory results because there isn't all that much difference between house cusps in the different systems, and because intuition overrides all other factors in astrology anyway. So it is possible to get good results in spite of using the Koch house system.

But when grandiose claims are made for the efficacy of some Koch-based technique - particularly when it is alleged that said technique will work only in conjunction with the Koch house system - then we can be certain that these claims are specious.

Thus, just as 2 + 2 = 4, it is apodictic that e.g. Wangemann's work on facial appearance, Hubers' age progressions, and dePenguern's "saving several dozens of peoples LIVES ... because KOCH works ALL the time, on EACH CHART", are - to put it charitably - mistaken.

M. J. MAKRANSKY
GUATEMALA
NOVEMBER, 1990

THE SOLAR HOUSE SYSTEM

Most of us astrologers have at one time or another wondered why astrology doesn't "work" as well as it's "supposed to". Although adamant in defense of astrology when confronted by skeptics, we nonetheless agonize in our innermost souls as to whether the ancient astrologers were lying, or whether astrology just doesn't function as well in this decadent age; or whether (horror of horrors!) we may just be fooling ourselves.

No, no; it can't be that. After all, that prediction we made about cousin Tillie's boyfriend was right on the button! So why then, if astrology does work so well sometimes, do we find it so hard to make it work consistently. Where does the fault lie, dear Brutus - with astrology, or with ourselves? Actually, the problem is not with astrology per se, but with how we occidental astrologers have been practicing it (or better said, conceptualizing it) for the past several centuries. Ever since astrology and astronomy parted company 300 years ago, both branches of the stellar science have gone astray. They've lost contact with their true roots - the astrology spirits who, from time immemorial, have guided astrologers and helped them to make accurate judgments.

The Hindu astrologers never lost contact with the astrology spirits, and hence they haven't gone through the crisis of confidence experienced in the west. The Hindu astrologers respect the astrology spirits (heed their counsel); they respect their craft; they respect themselves; and therefore they are respected in turn by their community. We occidental astrologers - in our endeavor to turn astrology into a "reasonable" and "rational" (hence "respectable") science (which it isn't) - have turned our backs on the astrology spirits, have prostituted our craft and ourselves, and thus justly deserve the opprobrium which mainstream society heaps upon us. If we were delivering up accurate predictions, you can be sure they'd be singing a different tune.

To the astrology spirits, all statistical research is hooey. It may be interesting and even illuminating, but even if it did score little points before the Rationalist-Materialist Inquisition (which it doesn't), it has nothing whatsoever to do with astrology. Astrology is not a matter of mind nor of logic.

The aphorisms of the ancient astrologers were not meant to be taken as rules (in the modern sense) but rather as examples of how to interpret charts by the spirit (by intuition). We occidental astrologers have our "rules" (e.g. that Moon in the 2nd house means such-and-such, or that Mars square Saturn means thus-and-so, etc.), and then we try to deduce meanings by using logical deduction (reasoning).

Rather, the thing should be done by feeling, not by thinking. The ancient astrologers (and the Hindus) did it that way. We don't need astrology spirits to interpret horoscopes; we can do that with our own feelings once we've learned how to get our intuition flowing. What the spirits want to do at this time is to teach (or reteach) us occidental astrologers HOW.

Of course, there are some astrologers out there right now who are already doing this as a matter of course; and practically every astrologer has done it now and then (made an astoundingly accurate prediction without knowing quite how he did it). What the spirits want to do is to show us how to do it ALL THE TIME (i.e. consistently give our clients specific, exact information rather than vague generalities such as those which are cranked out by computers).

To start with, the astrology spirits recommend changing the manner in which we calculate horoscopes. This is not because there's anything wrong with traditional house systems per se (after all, the ancient astrologers got good results from them). Rather, by misusing these horoscopes (by treating astrology and its guardians with disrespect) we occidental astrologers have put "bad vibrations" over these horoscopes, and so have rendered them inoperative.

The spirits recommend abandoning all current house systems and using instead a system of 24 half-houses (called "Solar Hours") which are precisely analogous to the planetary hours. The exact details of how interpretation works in this system have yet to be worked out (although an algorithm for computing half-house placements of natal planets is available - i.e., these new horoscopes can be computed, but not yet interpreted).

In the meantime, the spirits recommend using a system of 12 houses in which the houses have the usual meanings (1st = personality, 2nd = money, etc.), but which are calculated as follows:

To obtain the houses above the horizon (7-12), the Sun's diurnal arc (the length of time from sunrise to sunset) is divided into six parts; to obtain the houses beneath the horizon (1-6), the Sun's nocturnal arc (the length of time from sunset to sunrise) is divided into six parts. Then these 12 division points are projected onto the ecliptic with house circles (house circles are great circles on the celestial sphere which pass through the north and south points on the horizon. The Campanus and Regiomontanus systems also project with house circles, but the former divides the prime vertical into 12 parts, and the latter divides the celestial equator into 12 parts).

Because this new house system results from a division of the Sun's diurnal circle, we call it the Solar House System. Although we are trying to get away from logic, a moment's reflection will show that the Sun's diurnal circle is indeed the most logical circle to divide to produce mundane houses. If the houses are to be considered analogous to the signs; and if the signs result from a division of the Sun's yearly path (the ecliptic); then it follows that the houses should result from a division of the Sun's daily path (its diurnal circle, or declination circle - i.e., the small circle parallel to the celestial equator which passes through the natal Sun).

Since the analogy requires that the angles be house cusps (or in any event, the spirits require it), projection of these 12 division points must needs be with house circles, since only a projection with house circles retains both the Ascendant and the MC as house cusps.

The Solar House System has two unusual features:

1) Three parameters (Sidereal Time, Latitude, and Declination of natal Sun) are required to compute house cusps, rather than only two (ST and Latitude) required by all other house systems. This feature precludes a table of houses for the Solar House System; but in this age of computers, this is not really a problem.

2) Opposite house cusps (except for the 4 angles: Asc, IC, Desc., and MC) do not lie opposite in the zodiac. In fact, it's common to find intercepted pairs of signs which do not lie opposite in the zodiac. This is an odd feature, but certainly not an objectionable one.

When I began recalculating the horoscopes in my files using the Solar House System, the first experiment I tried was secondary progressions to intermediate house cusps. I had always regarded secondary progressions to intermediate house cusps to be the acid test of proof for a house system (transits, because of retrogradation, are too uncertain to use as a test for timing). I had never seen secondary progressions to intermediate house cusps work in any of the half-dozen other house systems in which I'd tried them.

Needless to say, they didn't work in the Solar House System either. Disappointed, I was about to file the whole idea away for the duration, when I happened to take a vacation and found myself in the (for me) unusual position of doing a lot of face-to-face natal consultations for complete strangers. I calculated all these new charts using the Solar House System, and I discovered the following:

Using the Solar House System and the traditional house symbolisms (e.g. 7th — marriage, 8th — death, 9th — journeys/religion, etc.), I find that I obtain much clearer psychic impressions than I've ever experienced before, in the 20 years I've been studying astrology. My astrology has just mysteriously reached an altogether new level. I'll be looking, at some feature in a chart, and then suddenly I'll just know, beyond a shadow of a doubt, precisely what happened to that guy at age 6; or what he'll be doing in 20 years; or what's bothering him right now.

Sometimes an actual picture pops up before the mind's eye; but more often it's just a feeling of something known - like reaching for a memory of something which you know, but can't quite put your finger on - which horoscope symbols help you "pin down" or express in words.

The impressions definitely come from the native, not the horoscope. Nonetheless, the horoscope is intrinsic to the process. All feelings take off from symbols in the horoscope; and also the horoscope serves as a focus or way of conceptualizing feelings which are in the air. It can't be done without the horoscope (at least I can't do it without the horoscope).

Although you can use intuition with everyone, the clearest impressions come from natives who are themselves psychic, or who are at least open-hearted and straightforward people. The guy who sits there with his arms crossed and with an "I dare you!" look on his face can effectively block any attempts to psychically probe him. You have to break down such a native's screen of thought forms (penetrate his defenses) before you can give him his money's worth. I can usually get an antagonistic or dubious client to loosen-up by starting (in a friendly and easy manner) with his current progressions and transits. I get him used to the sound of my voice; I let him know I'm not threatening or judging him; and then, when he's relaxed, I can start pulling impressions out of him. The point is that if you're going to be an intuitive astrologer, you have to be open to the native (rather than defending some sort of ego trip of your own). This means respecting the native, and also respecting yourself; it means giving him emotional space, and at the same time, not permitting him to encroach upon yours.

There is really no other way of being able to give specific information to a client except through intuition. That's the only way to cut through all the innumerable possibilities of what the symbols could mean logically, to arrive at what they do mean in a particular case. The rationalist astrologers who believe that astrology should be based upon reason rather than intuition are only promulgating an astrology of distrust - in the spirit, distrust in their own abundant inner knowledge, and distrust in the craft of astrology. Astrology is a wavelength we can tune into - not a dead specimen we can dissect and expect to learn anything from. We are not advocating some woolly "blind faith" in astrology here - we're talking about concrete results that we can each validate for ourselves in our own practice.

The Solar House System is a link, given to us by the astrology spirits, to help us activate and utilize our latent intuition. If you use a house-based astrology in your practice, I highly recommend your giving the Solar House System a whirl. I think you will be surprised and gratified to find how such a simple adjustment as changing the house system you use can produce such an amazing difference in the specificity and accuracy of your predictions.

SOLAR HOUSE CUSP ALGORITHM

```
1)  Given DEC = declination of natal sun, LAT = latitude of
    birthplace, and RAMC = right ascension of the midheaven
    (= 15 x Sidereal Time of birth),
    Let AD = Arcsin (tan DEC tan LAT)
    Let NSA = 90 - AD and let DSA = 90 + AD
2)  For the 2nd cusp, let X = -(2/3) NSA
            3rd           X = -(1/3) NSA
            5th           X =  (1/3) NSA
            6th           X =  (2/3) NSA
            8th           X = -(2/3) DSA
            9th           X = -(1/3) DSA
           11th           X =  (1/3) DSA
           12th           X =  (2/3) DSA
3)  For each cusp,
    Let DEC = declination of natal sun
    Let MD = absolute value of X
    Let RA = RAIC + X (for cusps 2 - 6)
     or RA = RAMC + X (for cusps 8 - 12)
4)  For each cusp, compute the ZD:
    If MD = 90, then ZD = 90 - Arctan (sin LAT tan DEC)
    If MD < 90, then Let A = Arctan (cos LAT tan MD)
                     Let B = Arctan (tan LAT cos MD)
    For cusps 2 - 6  Let C = B + DEC
    For cusps 8 - 12 Let C = B - DEC
    Let F = Arctan (sin LAT sin MD tan C)
    Let ZD = A + F
5)  For each cusp, compute the pole, Q, and W:
    pole = Arcsin (sin ZD sin LAT)
    Q = Arcsin (tan DEC tan pole)
    W = RA - Q (for cusps 11, 12, 2, and 3)
    W = RA + Q (for cusps 5, 6, 8, and 9)
6)  If W = 90 then let R = Arctan (sin E tan pole) and
          For cusps 11, 12, 2 and 3  CUSP = 90 + R
          For cusps  5,  6, 8 and 9  CUSP = 90 - R
    If W = 270 then let R = Arctan (sin E tan pole) and
          For cusps 11, 12, 2 and 3  CUSP = 270 - R
          For cusps  5,  6, 8 and 9  CUSP = 270 + R
    If W ≠ 90 or 270, then
          Let M = Arctan |tan pole / cos W |
    where E = obliquity of the ecliptic
```

```
7)  For cusps 11, 12, 2, and 3:
          If $90 < W < 270$, then let $Z = M - E$
                    otherwise, let $Z = M + E$
    For cusps 5, 6, 8, and 9:
          if $90 < W < 270$, then let $Z = M + E$
                    otherwise, let $Z = M - E$
    If $Z = 90$ then
            If $W < 180$ then $CUSP = 90$
            If $W > 180$ then $CUSP = 270$
    If $Z > 90$, then the value of CUSP obtained in Step 9
    below will fall away from Cancer (if $W < 180$) or
    Capricorn (if $W > 180$) in the opposite direction from
    that computed in Step 9.
8)  For each cusp, let $R = \arctan |\cos M \tan W / \cos Z|$
9)  For each cusp, if $W < 90$ then $CUSP = R$
                   if $90 < W < 180$ then $CUSP = 180 - R$
                   if $180 < W < 270$ then $CUSP = 180 + R$
                   if $270 < W < 360$ then $CUSP = 360 - R$
For southern latitudes, use RAIC in place of RAMC, and then
add (or subtract) 180 degrees to the CUSPs at the end.
```

Test Date: DEC = -18.38, LAT = 51.50, and RAMC = 12.37

2nd = 27 LE 18
3rd = 17 VI 04
5th = 23 SC 06
6th = 4 CP 53
8th = 21 AQ 12
9th = 10 PI 33
11th = 7 GE 04
12th = 15 CN 29

SOLAR HOUSE MUNDANE PRIMARY DIRECTIONS ALGORITHM

As of this writing, the author has not yet had the opportunity to test primary directions in the Solar House System. The spirits particularly suggested directing natal planets to mundane conjunctions with the intermediate house cusps. This entails calculating the values of pole and W for the cusp in question per Step 5 of the Solar House Cusp Algorithm given above, and then using these values together with the promissor's declination in Formulas IV - 4, IV - 5, and IV - 6 (page 40) to obtain the arc of direction, which must be equated to time with the True Solar Arc in RA.

The general algorithm for directing a promissor to mundane aspect with a significator is as follows:

1) Let DEC = declination of natal sun; and let AD = sun's ascensional difference, DSA = sun's diurnal semi-arc, and NSA = sun's nocturnal semi-arc, per Step 1 of Solar House Cusp Algorithm.

2) Given the significator's RA and Declination, compute its MD (page 15) and thence its ZD, pole, Q, and W (pages 38-39)

3) Compute the RA of the point of intersection of the sun's diurnal circle with the house circle passing through the significator:
If Significator lies in Quadrants 1 or 4, then
RA = W + Arcsin (tan DEC tan pole)
If Significator lies in Quadrants 2 or 3, then
RA = W − Arcsin (tan DEC tan pole)

Where DEC is the declination of natal sun, pole is the Significator's pole, and W is the Significator's oblique ascension under own pole. From this value of RA, compute the MD of the intersection point (page 15).

4) Compute the Mundane Position (MPS) of the Significator:
If S lies in the 1st Quadrant, then MPS = 90 − 90 MD / NSA
2nd MPS = 90 + 90 MD / NSA
3rd MPS = 270 − 90 MD / DSA
4th MPS = 270 + 90 MD / DSA
where MD is the MD of the intersection point from Step 3, and DSA or NSA is the appropriate semi-arc of natal sun.

5) Add the value of the mundane aspect to the Mundane Position of the Significator to obtain the MP of the aspect point:
MPAP = MPS + A

6) Compute the Meridian Distance and RA of the aspect point:
If 0 ≤ MPAP < 90 then MDAP = NSA (90−MPAP)/90, RAAP=RAIC−MDAP
If 90 ≤ MPAP < 180 then MDAP = NSA (MPAP−90)/90, RAAP=RAIC+MDAP
If 180 ≤ MPAP < 270 then MDAP = DSA (270−MPAP)/90, RAAP=RAMC−MDAP
If 270 ≤ MPAP < 360 then MDAP = DSA (MPAP−270)/90, RAAP=RAMC+MDAP
where DSA or NSA is the appropriate semi-arc of natal sun, and MPAP is the Mundane Position of the aspect point (Step 5)

7) Using the RAAP and MDAP of the aspect point together with the declination of natal sun, compute the ZD, pole, Q, and W of the aspect point (pages 38–39), and then direct the promissor to mundane conjunction with this aspect point (page 40).

Example: MO TRI SA Solar mund c:
1) Sun data: DEC = −18.38, NSA = 114.70, DSA = 65.30 (page 19)
2) Saturn data: pole = 41.40, W = 147.84 (page 49)
3) RA = 147.84 + Arcsin (tan −18.38 tan 41.40) = 130.81
MD = 61.56
4) MPS = 90 − 90 x 61.56/114.70 = 41.70
5) MPAP = 41.70 − 120 = 281.70
6) MDAP = 65.30 x (281.70 − 270)/90 = 8.49; RAAP = 20.86
7) A = 5.31; B = 51.19; C = 69.57; F = 17.23; ZD = 22.54;
pole = 17.46; QAP = −6.00; WAP = 20.86 − (−6.00) = 26.86;
Moon's declination = 11.23, hence Moon's Q under the pole of the aspect point = Arcsin (tan 11.23 tan 17.46) = 3.58;
hence Moon's analogy of W = 28.47−3.58 = 24.89; hence
Arc = 24.89 − 26.86 = −1.97.

M.J. MAKRANSKY
COBAN, GUATEMALA
MARCH, 1995

INEXACT ASTROLOGY

I have been studying the subject of primary directions for over twenty years; and in that time I have investigated various claims of "exact prediction" using Primary Directions. (P.D.'s) Without exception I have found these claims to be either false or equivocal (not enough date given to judge). I don't believe that the authors of these claims were acting in bad faith, but rather that they fell into two errors: miscalculation and multiplicity.

A.J. MANTEL (Considerations VM. VIII Nos. 3 & 4, VM IX No 2) A.P.C. System (Ascendant Parallel Circle) It's a house system used in Holland (see Considerations VM VIII No.s' 3 and 4 for details)

ZODIACAL PRIMARY DIRECTIONS PER MANTEL

TABLE I

#	ORB PER MANTEL	ACTUAL ORB	DIRECTION	EVENT
2	2'	42'	JU 120 NP	STARTED FIRST WORK
7	2'	71'	JU 180 MA	FAILED FINAL EXAMS
10	4'	7'	LU 0 ME	BEGAN WORK MUNICIPALITY
11	2'	1'	LU 120 UR	BEGAN WORK AT POST OFFICE
13	1'	70'	MC 9 NP	MARRIED
15	1'	1'	NP 90 ME	BEGAN WORK ROLLING MILL
17	4'	4'	SO 90 JU	DAUGHTER BORN
23	0'	1'	PL 60 NP	MOVED TO VELSEN
29	1'	1'	PL 0 SA	ONSET OF DERMATITIS
34	3'	2'	SO 60 SA	WIFE ADMITTED MENTAL HOSPITAL
41	1'	0'	JU 0 ASC	DEATH OF MOTHER
51	1'	60'	LU 90 JU	FINAL BREAK WITH J.B.
55	2'	20^0 16'	SO 120 JU	RECEIVED MONEY

We will limit our discussion to Mantel's zodiacal primary directions, ignoring for the time being his mundane primaries and secondary progressions.

Mantel claims that 13 events in his life correlate with zodiacal P.D.'s within orbs of 3' arc (primary directions one degree of arc is roughly equal to a year of lifespan, so 3' arc equates to roughly 2 1/2 weeks of real time).

Of these 13 events, seven are in fact correctly calculated (#'s 11, 15, 17, 23, 29, 34, 41); although in three of them (#'s 17, 34 and 41) I question the aptness of the astrological symbolism (SO 90 JU for birth of daughter? SO 60 SA for wife admitted to mental hospital? JU 0 ASC for death of mother?)

In any case, the other 6 of the 13 events (#'s 2, 7, 10, 13, 51 and 55) are grossly miscalculated (error = 42', 71', 7', 70', 60' and 20^0 16', respectively). In other words, almost half of Mantel's calculations are wrong (fall outside his 3' orb limit). So much for calculation errors.

The error of multiplicity is the inverse of Occam's razor - that if you take enough factors into consideration, you can account for anything. If we use Mantel's technique, what are the probabilities of a primary direction coinciding with an event by chance? If we use 3' orbs (hence 6' of space), 11 natal points (10 planets plus one angle) *, 9 5/8 directed points **, 8 aspects (0, 180, ±60, ±90, ±120), and 2 directions (converse and direct),

$$\frac{6 * 11 * 9\,5/8 * 8 * 2}{60 * 360} = \frac{10164}{21600} = .47$$

In other words, there's almost a 50% chance of there being some zodiacal primary direction or other within 3' orb of exactitude at any time (for any given event). If Mantel only found 7 zodiacal P.D.'s within 3' orb out of a total of 59 events, then he's doing considerably worse than chance (one would expect 59 * .47 = 28 events within 3' orb due to chance alone). This is also why it's important to pay attention to the symbolism - to ask the question, does the astrological symbolism make sense (could one conceivably have predicted that event from that planetary and aspectual symbolism)? Otherwise all we're doing is engaging in wishful thinking, which is the danger in the sort of post hoc analysis which astrology, b y its very nature, forces us to employ.

* 11 natal points because ASC and MC are almost square, so we'll count them both as only one angle.

** 9 5/8 directed points because SO, ME, and VE tend to bunch and hence represent only 1 + 1/8 + 1/2 = 1 5/8 sets of aspects instead of 3; and we'll arbitrarily eliminate directions of a body to its natal place: which makes for 9 5/8 directed points instead of 12.

ALEXANDER MARR (Considerations VM VII No 3) - Topocentric System.

TOPOCENTRIC P.D.'s WHEN MAO JOINED THE ARMY, PER MARR

TABLE II

#	ORB PER MARR	ACTUAL ORB	DIRECTION
1	4'	3'	XII 150 NP R-R (RADIX-RADIX)
2	5'	34'	NP 180 XII E-R (EPOCH-RADIX)
3	5'	?	NN 90 XII E-R IMPOSSIBLE TO DETERMINE
4	1'	36'	SO 180 MC E-R
5	1'	37'	UR 135 PL E-E
6	6'	6'	SA 180 ME R-E
7	2'	2'	MC 45 SA R-E
8	0'	39'	ME 45 MA E-E

In Marr's rectification of Mao Tse-tung's chart, he lists 21 events in Mao's life, giving an average of 6 P.D's within 10' orb correlating with each event (he also lists secondary progressed and regressed directions, but we won't consider these here). Table II lists the P.D.'s given by Marr for the first event, Mao joining the army. Of the 8 P.D.'s listed for this event, one of them (#3) is so far out of line that there's no way of determining what Marr had in mind. Of the remaining 7, 3 of them (#'s 1, 6 and 7) are in fact correctly calculated, and the other 4 are off by over half a degree (half a year in real time)

Indeed, of the 110 P.D.'s listed by Marr altogether, * only 54 of them are within 10' orb as claimed by Marr; the other 56 ranged all over the lot (the examples given in Table II are fairly typical of the whole). Marr claims an average orb of inexactitude for these 110 events of 3.8' arc (about 3 weeks in real time); the actual average orb is 20.9' arc (over 4 months in real time).

* 5 were thrown out because they made no sense, and 6 involving POF weren't considered.

Moreover, it is difficult to determine precisely why Marr listed the directions he did for each event, since his employment of the error of multiplicity puts Mantel's to shame. Marr uses 10' orbs, hence 20' of space with 32 natal points (10 planets, Node, 6 cuspal pairs; in both the radix and epoch charts = 34 points, less 2 for the Moon/ASC interchange), with 31 directed points (same, less directions to own natal place), with 16 aspects (all multiples of 15 degrees) and with 2 directions (converse and direct), so we can expect roughly -

$$\frac{20 * 32 * 31 * 16 * 2}{60 * 360} = 29.4 \text{ P.D's within 10' orb}$$

of exactitude for any given event. In fact, for the event Mao joining the army, there are no less than 27 Topocentric P.D.'s (24 of which Marr overlooked) within 10' orb of exactitude (see Table III). With so many possibilities available, you could cut and fit as you choose (though I don't accuse Marr of doing this, though he does seem to choose that one house cusp from each pair which best matches the symbolism of the event). But even assuming that Marr's system of prediction is valid, how on earth are you supposed to make predictions from a list of 30 P.D.'s in effect every moment?

ALL TOPOCENTRIC P.D.'s IN EFFECT WHEN MAO JOINED THE ARMY

TABLE III

ORB	DIRECTION
0'	UR c 0 SA E-R
0'	NN d 90 LU E-R
1'	ME d 90 XII R-E
1'	LU c 0 SO E-R
1'	NN c 0 VE E-E
2'	VE d 90 MC E-E
*2'	MC d 45 SA R-E
*3'	XII d 150 NP R-R
4'	NN c 90 XII R-R
4'	VE c 90 III E-E
5'	SO c 135 JU R-E
5'	MA c 150 NP R-E
5'	JU d 120 SA R-E
*6'	SA c 180 ME R-E
6'	V c 30 NN R-R
6'	III d 90 VE E-E
8'	LU d 90 PL R-R
8'	NP c 150 XII R-R
8'	XII c 150 UR R-E
8'	III c 30 VE R-E
9'	ME c 120 MC R-E
9'	JU d 135 SA R-R
9'	LU c 90 III E-R
10'	UR c 135 NP R-R
10'	ME d 30 JU E-R
10'	MA c 0 JU E-R
10'	III c 180 NP E-R

* ALSO LISTED BY MARR

CHARLES JAYNE
(PROGRESSIONS AND DIRECTIONS)
Campanus System

Jayne also claims exact prediction with P.D.'s ("Orbs are a sign of ignorance!") Though he gives only a handful of examples of P.D's in his book, his calculations are the sloppiest in the entire field. Here's a typical Jayne calculation (for SO 90 JU zod d (this is primary directions jargon, "zod d" means "zodiacal direct" (as opposed to "mundane converse") in his own chart):

	Jayne Version	Correct Version
RA 90 SO	- 286° 47'	287° 03'
Q 90 SO	- 12° 11'	12° 27'
W 90 SO	- 277° 46'	274° 36'
W JU	- 216° 02'	215° 51'
ARC	- 58° 44'	58° 45'

It turns out that 58° 45' *is* the correct answer; but how Jayne arrived at it through that series of incorrectly calculated inputs and mis-subtractions is unfathomable. Wading through Jayne's calculations (supposedly an introduction for beginners) is like watching a drunk try to thread a needle: he stabs at it, and stabs at it, and stabs at it, and finally shuts his eyes, and voila!

Also, Jayne uses geocentric rather than geographic latitude in his calculations, which is manifestly incorrect: geographic latitude should be used in *all* astrological calculations (see Dean, *Recent Advances* page 182, or my *Primary Directions* page 9, for a refutation). This is a minor point, since using one latitude rather than the other in P.D.'s doesn't usually make much difference in the final result; but Jayne himself makes a big deal out of it. He points out that with the Ascendant near the cusp of Aquarius or Gemini at London, the difference between geocentric and geographic latitude can produce a difference of over 4 months in the timing of some P.D.'s, and "such an error is inadmissible in any serious or professional work."

Jayne's use of the error of multiplicity is the most creative I have yet encountered. Instead of multiplying the factors to be taken into consideration (horoscope points and aspects), Jayne multiplies techniques. He uses only the usual natal planets, angles, and the Ptolemaic aspects, but he calculates each P.D. no less than 60 ways: in 10 "field planes" (using the celestial latitudes of all 10 planets), and equating arcs of direction to time 6 different ways (True Solar Arc in RA, Ascendant Arc, Vertex Arc; and these same 3 arcs measured in declination).

So with the 5' orb Jayne recommends (10' of space), we have 11 natal points, 9 5/8 directed points, 8 aspects, 2 directions, and 60 techniques which yields, on the average, about 47 P.D.'s per event!

ROBERT DELUCE
(COMPLETE METHOD OF PREDICTION)
and J. ALLEN JONES
(DIAGRAMS FOR PRIMARY ARCS)
Placidus System

The zodiacal directions described by these two practitioners are based on an incorrect theory; while they carry out their calculations correctly, they are not calculating what they think they're calculating (they use great circle formulas to describe curves which are not great circles - see my Primary Directions book, page 75, for details). Presumable this is why DeLuce uses orbs of inexactitude of ± 2° of arc (2 years in real time)! Moreover DeLuce, like Jayne, employs field plane directions; therefore, even though he only uses one method of equating arcs to time instead of 6, his use of 2° rather than 5' orbs of inexactitude will produce 4 times as many P.D's for each event as Jayne's method.

WILLIAM SIMMONITE
(COMPLETE ARCANE)
ZADKIEL
(GRAMMAR OF ASTROLOGY)
and ALAN LEO
(PROGRESSED HOROSCOPE)
Placidus System

These practitioners use mundane directions, or else zodiacal directions mundanely, hence they avoid the theoretical error into which DeLuce and Jones fell. As a matter of fact, these 19th century practitioners, working by hand with log tables, produced the most accurate calculations I have examined.*

However, both Simmonite and Zadkiel fell into the error of multiplicity by using all multiples of 15° aspects, and two modes of calculation (zodiacal and mundane), which produces, for orbs of 5' arc, roughly 4 directions for any given event. Thus the lists of example directions they give (for the horoscopes of Queen Victoria and Ada Byron) are not that convincing.

*Except for a trivial error in the Moon's semi-arc in the example speculum (Annie Besant's) given by Leo, which invalidates all the directions involving the Moon.

SLYVIE WEBER
(ASTROLOGICAL JOURNAL JULY-AUG 1992)
Regiomontanus System

There is not enough data given in the article to ascertain how she is calculating her P.D.'s. Although she gave her mailing address in the article and invited correspondence on the subject, she has disdained my letters of inquiry; hence it is not possible to draw any conclusions respecting her claims.

Exaggerated claims of "exact prediction" made for this or that system of P.D.'s tend to give primary directions a bad name, which is a pity because P.D's are in fact one of the most powerful and effective predictive techniques in the astrologer's toolkit. Zodiacal P.D.'s to angles (using Ptolemaic aspects), equated to time with the True Solar Arc in RA measure, usually produce important events (consonant with the astrological symbolism involved) within an orb of less than 5' arc (a month in real time)* For further information see my book on Primary Directions. Available for U.S. $30, air postpaid from: Dear Brutus Press, Apartado #36, Coban, Alta Verapaz, Guatemala. Please send check or money order only (NO CASH).

*Conjunctions to angles - which usually correlate with more important events than sextiles, squares, or trines - can be off by as much as 2 or even 3 months in some cases.

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GUATEMALA
NOVEMBER, 1992

VARIANT FORMS OF GEODETIC EQUIVALENTS

Readers who have been following my continuing exposition of the house division question are aware of the fact that our choice of which house system to use not only determines how we should calculate horoscopes, but also, how we should calculate primary directions, Arabian parts, and astrolocality maps as well. By the same logic, our choice of house system also determines how we should calculate geodetic equivalents. In this article I will describe two theories of geodetic equivalents which have been propounded by previous authors (Sepharial and Johndro), as well as a new approach which is published here for the first time.

SEPHARIAL'S METHOD

Astrologers (like most people) like things simple and clear-cut. They don't want to know that there are a myriad of different possible ways of performing the same calculations, and that there is no a priori reason for preferring one way over another. For example, they use Placidus houses because until very recently those were the only kind of house tables available, which was the result of a decision made by some ignoramus several centuries ago. Similarly, they use Sepharial's method of calculating geodetic equivalents because Sepharial was the first to publish a book on the subject, and he calculated them the way he did because he didn't know (or care) enough about mathematics to calculate them any other way.

In Sepharial's method the terrestrial longitude of a place east of Greenwich is equated to zodiacal longitude. For example, the terrestrial longitude of Berlin is 13E23, so its zodiacal longitude is taken to equal 13AR23. For locations west of Greenwich, the terrestrial longitude is first subtracted from 360, and then equated to zodiacal longitude (e.g. the terrestrial longitude of Washington equals 77W01; 360 - 77W01 = 282-59 = 12CP59). The zodiacal longitudes of place obtained in this fashion are considered to be Midheavens; a table of houses is consulted with this Midheaven and the terrestrial latitude of the place to obtain an Ascendant (e.g. Berlin's latitude = 52N30, so its ASC = 6LE10; Washington's latitude = 38N53, so its ASC = 23AR11).

Sepharial's method is the most popular one in use among earthquake predictors (see e.g. recent articles by Jim Haynes in Considerations vm. VI no. 2, and Ann Parker in MH 25/X/39). However, from a mathematical point of view, this method is a mish-mash for the following reasons:

1) Terrestrial longitude corresponds to right ascension in the sky, not zodiacal longitude (since both terrestrial longitude and right ascension are measured in the plane of the earth's equator, whereas zodiacal longitude is measured in the plane of the ecliptic). To impose an ecliptic measurement on the earth's equator is to badly jumble the geometrical symbolism.

2) To then derive an "Ascendant" from such a "Midheaven" is a completely fictitious calculation; you can plug numbers into it and get numbers out again, but it's GIGO - it isn't a valid geometrical model because it doesn't describe anything that's actually going on out there in an astronomical sense.

3) The choice of the Greenwich meridian baseline (Greenwich 0° Aries) is wholly arbitrary and unfounded, again because it doesn't model any geometrical or geophysical reality.

JOHNDRO'S METHOD

A correct method of calculating geodetic equivalents is the same as a method of calculating astrolocality maps for a universal house system for a given Sidereal Time. A universal house system is one in which the projection poles don't depend upon a given place of birth (see MH 72/25 and 73/22). There are two such house systems: Meridian (which includes Alcabitius as a subset), which projects from the north pole (of the earth or sky); and Morinus (which includes Equals and Porphyry as subsets) which projects from the ecliptic pole (of the earth or sky).

The Johndro method of calculating geodetic equivalents is the same thing as a Meridian (Astro*Carto*Graphy) astrolocality map, for one of two fixed Sidereal Times. In the course of his career Johndro advocated two possible Sidereal Times, switching back and forth as he discovered that neither one of them worked very well (see Dean, Recent Advances, page 193). Johndro's pyramid baseline system uses an ST = 1h 56m 40s on the Greenwich meridian (in 1930; or ST = 1h 59m, 52s in 1992). This method puts the Aries point on the earth's equator at 29° 58' west longitude in 1992. Supposedly, the Aries point was located on the meridian of the Great Pyramid at the time it was built, and has receded westward in the interim due to precession. Later Johndro switched from the pyramid baseline to a Greenwich baseline, i.e. and ST = 0h 0m 0s at Greenwich (which doesn't move due to precession).

Using the pyramid baseline, the right ascension of a place on earth is equal to 29° 58' (in 1992) plus the terrestrial longitude of the place east of Greenwich. For example, the terrestrial longitude of Berlin is 13E23; 29-58 + 13-23 = 43-21, which is taken to be the RAMC of Berlin. From a table of houses for the latitude of Berlin (52N30) we find that this RAMC corresponds to an MC of 15TA49 and an ASC of 27LE40.

Using the Greenwich baseline, the right ascension of a place on earth is equal to its terrestrial longitude east of Greenwich. Again, a table of houses is consulted for the latitude of the place to obtain values for the MC and ASC (in the case of Berlin, an RAMC of 13-23 at 52N30 yields an MC = 14AR32 and an ASC = 6LE55).

Although Johndro's method (unlike Sepharial's) is based on a correct astronomical model, the use of a Greenwich baseline is wholly arbitrary and unfounded; and the use of a pyramid baseline, while not unfounded (since it does align with an actual feature on the earth) is still arbitrary. Why not use the Potala Palace; or Tikal; or Disneyland? Also, the notion that the baseline moves along the earth's equator due to precession is an arbitrary and unfounded assumption.

Moreover, in deriving his Ascendants, Johndro employed geocentric rather than geographic latitude, which is incorrect. Geographic latitude should be used in all celestial sphere calculations (see Dean, page 182).

It is not surprising, therefore, that Johndro could not obtain satisfactory results from either of his systems.

ZODIACAL METHOD

The other universal house system is that of Morinus, which gives rise to the Zodiacal method of calculating astrolocality maps (see MH 68/6), which can be used in turn to obtain a system of Zodiacal geodetic equivalents once we specify a Sidereal Time. In this case, however, we do have one obvious baseline at our disposal which is not wholly arbitrary and unfounded.

In Zodiacal astrolocality maps we project from the north ecliptic pole, which is located at a terrestrial latitude of co-obliquity (about 67° North), and which sweeps around the 67th parallel in the course of 24 hours. If we place the north ecliptic pole on the meridian of the north magnetic pole, then we've got a system of geodetic equivalents which makes some kind of logical sense (which is not to say that it would necessarily work in practice).

The earth's magnetic poles move over time; in 1992, the north magnetic pole is located at 104W18, 78N24; and the south magnetic pole is located at 138E42, 64S42. To calculate the Zodiacal longitude for a given place on earth, we identify 104W18 with an RAMC of 270 (which is the RA of the north ecliptic pole). In other words, we use the Zodiacal Longitude of Place Algorithm (available from Edith for a long self-addressed stamped envelope) with a birthplace longitude = 104W18 and an ST = 18 hours. To project from the south magnetic pole, we go in the Zodiacal Longitude of Place Algorithm with a birthplace longitude = 138E42 and an ST = 6 hours.

The main theoretical objection to this system of geodetic equivalents is that the north and south magnetic poles do not lie exactly opposite from each other on the earth; and neither one lies on the 67th parallel (though they're close to it).

It has been suggested (by Bob Wachtel, co-author of the Occidental Table of Houses) that average values of the magnetic poles be computed by "smoothing out" the locus of points equidistant from the two magnetic poles to make a great circle on the earth.

It has also been suggested that the north magnetic pole be used to calculate Zodiacal longitudes for places on earth in the northern hemisphere, and that the south magnetic pole be used for places in the southern hemisphere; presumably, one would split the difference for points on the equator.

Unlike the Sepharial and Johndro methods, the Zodiacal method yields only one Zodiacal longitude for each place on earth, rather than two (an "MC" and "ASC"). Here is a table for several places on earth, with zodiacal longitudes computed according to each system (in the case of the Sepharial and Johndro methods, only the "MC"'s are given, not the "ASC"'s):

	LONG.	LAT.	SEPH.	JOHND. GREEN	JOHND PYR.	ZOD. N. POLE
LONDON	0W06	51N31	29PI54	29PI53	2TA02	6TA49
PARIS	2E20	48N50	2AR20	2AR32	4TA34	6TA50
BERLIN	13E23	52N30	13AR32	14AR32	15TA49	16TA51
MOSCOW	37E35	55N45	7TA35	9TA59	9GE14	4GE42
BEIJING	116E24	39N36	26CN24	24CN29	24LE03	2LE28
TOKYO	139E45	35N40	19LE45	17LE18	18VI49	22LE37
MELBOURNE	145E00	37S50	25LE00	22LE39	24VI31	29VI04
SAN FRAN.	122W26	37N47	27SC34	29SC45	27SG44	1SG05
CHICAGO	87W39	41N52	2CP21	2CP09	0AQ08	28CP45
WASHINGTON	77W01	38N53	12CP59	11CP56	10AQ30	12AQ50

Primary Directions . . .

a primer for beginners

M.J. Makransky

PRIMARY DIRECTIONS are one of the most powerful predictive tools astrology offers. The most basic and important life events, such as births of siblings, major moves, deaths of loved one, marriage, births of children, life and career changes, are more likely to be shown by primary directions to angles than by any other astrological technique. As directions are not so difficult to calculate, most anyone can learn how.

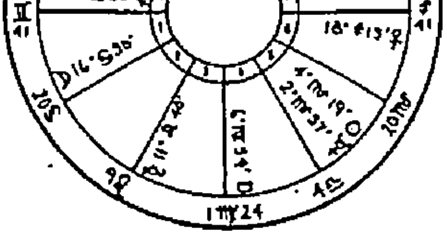
The basic idea behind primary directions is that in the hours after birth, the diurnal rotation of the earth moves the planets clockwise around the chart, to positions where they cross (or aspect) the angles (the horizon and meridian). For example, in Teddy Roosevelt's birth chart, Mars is located in 18°04' Capricorn, just below the 8th house cusp. In about 1.7 hours, the diurnal rotation of the earth will bring Mars down to the horizon (Descendant or 7th house cusp); and this 1.7 hours of real time is converted into symbolic time at a rate of approximately 4 minutes of real time = one year of symbolic time (so 1.7 hours equates to 25 1/2 years of life—i.e., age 25 1/2).

You can get a rough estimate of the time a primary direction to an angle will operate by taking the difference in longitude between the planet and the angle: for Mars conjunct Descendant d (direct), 18°04' Capricorn (Mars) - 25°41' Sagittarius (Desc.) = 22°23'. This estimate falls somewhat short of the actual time (25 1/2 years). Estimates of directions to the Midheaven and I.C. will usually be closer to exact than estimates of the directions to the Ascendant and Descendant (which vary depending on whether signs of long or short ascension rise, and also on how far north or south you are on the earth). With a little practice, you can do all these estimation calculations automatically, as you look at a chart, without really having to think about it.

It is also possible to take converse primary directions. For example, in Theodore Roosevelt's horoscope, Saturn is in 11°40' Leo, near the cusp of the 3rd house. About an hour and a quarter before birth, Saturn had crossed the lower meridian (I.C.). Using our formula of 4 minutes of real time = one year of symbolic time, this means the direction Saturn conjunct I.C. c (converse) operates at about age 19. We can roughly estimate this by taking the difference between the longitudes of Saturn (11°40' Leo) and the I.C. (1°24' Virgo) = 19°44'.

The theory of primary directions goes hand-in-hand with the theory of rectification of the birth time. In practice, the astrologer carries out both operations at once. Working from a list of prominent life events on the one hand, and a list of roughly estimated primary directions to angles on the other, a likely match-up is sought by trial and error. In particular, marriage is often shown by the conjunction of Sun, Venus or Jupiter to the Descendant; moves and major journeys are often shown by conjunctions to the Ascendant or I.C.; career changes and new life directions are often shown by conjunctions to the Midheaven; births of children by conjunctions to the Descendant or I.C.; deaths of

Tropical Regiomontanus



THEODORE ROOSEVELT
October 27, 1858, 7:48 P.M. LMT
40N45, 73W57

Direction	Calc. Date	Event Date	Event
Sat. conj. IC c	2/20/1878	2/9/1878	Father died
Uran. conj. Asc. c	9/5/1880	10/27/1880	First marriage
Moon conj. Asc. d	9/15/1882	10/1882	Moved into first home
Mars. conj. Desc. d	2/15/1884	2/14/1884	Mother and wife died
Pluto conj. Asc. c	11/1/1898	11/7/1898	Won NY gubernatorial
Sun conj. Desc. c	3/17/1900	4/1900	Drafted to run for VP
Merc. conj. Desc. c Mars conj. MC c	1/7/1901 2/24/1901	3/4/1901	Inaugurated VP
Moon conj. IC c	5/9/1902	5/12/1902	Anthracite Strike?
Sat. conj. Asc. d	5/11/1911		?
Merc. conj. IC d	10/17/1912	10/14/1912 11/5/1912	Shot by assassin (lived) Lost Presidential election
Sun conj. IC d	12/27/1913		?

Table I—Directions to Angles for Teddy Roosevelt

parents or spouse by malefic conjunctions to the Midheaven, I.C. or Descendant.

Here are some keywords for the sorts of events that might be expected when planets are directed to angles: Sun (decisive); Moon (emotional); Mercury (spontaneous); Venus (pleasing); Mars (dramatic); Jupiter (expansive); Saturn (final); Uranus (surprising); Neptune (elusive); Pluto (constructive); North Node (illuminating); Part of Fortune (serendipitous).

We note that Teddy Roosevelt's father died when the future President was 19 years old (which equates roughly with Saturn on the I.C. c); and that both his mother and his wife died (the same day) when Teddy was 25 years old (which equates roughly with Mars on the Descendant d).

The hypothesis that Saturn conjunct the I.C. c occurred at the time of Roosevelt's father's death leads to a rectified birth time of 7:49:11 P.M. LMT; and the hypothesis that Mars conjunct the Descendant d occurred at Roosevelt's mother's and wife's deaths leads to a rectified birth time of 7:49:30 P.M. LMT. In other words, the two hypotheses give the same rectified time of birth (within 19 seconds)! The recorded birth time is 7:45 P.M. LMT, so the rectified time is only four minutes different.

Obviously, I've chosen an example horoscope in which primary directions to angles worked quite well. On the other hand, this is not at all uncommon. The trial and error of rectification should lead to a moment when everything goes "click"—when there's a convincing match-up between predictions and actual events.

Observe, however, that as with every astrological technique, primary directions work better in some horoscopes than in others, and at certain periods of a given native's life than at others. And even when they work well, they can still fail up to a third of the time. The power of primary directions lies not in their infallibility, but rather in their ability (when they *do* work) to pinpoint the most important events and transitions in a person's life.

Using an average rectified birth time of 7:49:20 P.M. LMT, we obtain a list of directions to angles which occurred during Teddy Roosevelt's adult life, shown in Table I.

The events with question marks can be considered dubious; either there was no major life event at the expected time, or else the life event doesn't make sense in light of the astrological symbolism. For the most part, however, there is a good correspondence between predictions and events, within reasonable orbs of time (a few weeks).

Events of secondary (usually) importance in the life are often shown by aspects (other than conjunctions) to the angles, and by sign ingresses. For examples, see section A of Table 2.

To direct a planet to an aspect with an angle, just direct the aspect point to conjunction with that angle. For example, to direct Pluto to square MC c, take the point 6°36' Aquarius (the square to Pluto = 6°36' Taurus) and direct this point to conjunction with the MC in the usual way.

Sign ingresses often show periods of new

A. Events of secondary importance in Roosevelt's life			
Pluto square MC c	2/5/1883	3/9/1883	First public humiliation
Uran. sex. MC d	11/4/1886	11/2/1886	Lost NYC mayor's race
Uran. trine MC c	1/4/1887	12/2/1886	Second marriage
B. Sign ingresses and events in Roosevelt's life			
0°Aries conj. MC d	8/12/1884	8/1/1884	Retired to cattle ranch
0°Leo conj. Asc. d	11/29/1897	2/15/1898	Sinking of the Maine
C. Directions of Part of Fortune			
POF trine Asc. d	10/13/1872	10/16/1872	Started year-long world trip
POF sex. Asc. c	11/12/1897	12/20/1897	Species of elk named after TR

Table 2—Other Directions for Teddy Roosevelt

horizons, ambitions, and life interests. For these, see section B of Table 2.

Don't neglect to use the Part of Fortune in primary directions (longitude of POF = longitude of Asc. + longitude of Moon - longitude of Sun). These directions often bring joyous, unexpected, serendipitous events; and they also allow the astrologer to check on the soundness of the rectification (since the longitude of POF is critically dependent on an exactly rectified birth time). Examples are found in section C of Table 2.

Of course, whenever possible we should check out a rectified birth time against other astrological techniques. In this case, we note that, for example, on September 14, 1901, when Roosevelt assumed the Presidency after McKinley's assassination, transiting Neptune was in 1°22' Cancer, within two days of trining the rectified MC (1°24' Pisces).

Also, the Charubel degree symbol for this rectified MC is very apt (as Charubel symbols often are): "Pisces 2. A very long ladder. Denotes one possessed with a considerable amount of ambition. At the same time open to inspirations of a very lofty character. He or she will ever feel disposed to indulge mentally, if not actually, in speculations on a grand scale. A scholar and one who may do much in his day towards the elevation and salvation of mankind."

What we have been describing here are technically known as "zodiacal primary directions to angles equated to time with the True Solar Arc in Right Ascension measure." There is nearly unanimous agreement amongst modern authors on the subject of primary directions on the validity of these primary directions.

Because directions to angles work so well, it seems logical that it should be possible to direct planets to one another, as well as to angles. For example, after Mars by direct motion crosses the Descendant, it will some time later reach the position occupied by Venus (in the 6th house of the birth chart), which would form the primary direction Mars conjunct Venus d.

Unfortunately, it is not possible to unequivocally perform these calculations. Modern astrological thought on the subject is divided into three schools: the Placidians, the Campanians, and the Topocentrists. Various claims, some of them quite extraordinary, have been made by some of these practitioners for the validity of this or that method of calculating interplanetary primary directions (as opposed to directions to angles, on which they all agree).

I personally have spent twenty-odd years

(continued on next page)

raking through the mud, and investigating other astrologers' claims. At this point, I don't believe that there is a valid method of directing planets to one another, no matter how appealing that idea might seem. The only valid primary directions are those to angles (i.e., those described in this article). However, if anyone wants to wade into the mire, they are advised to read my book on *Primary Directions*, available from Dear Brutus Press, Apartado #36, Coban A.V., Guatemala (price is $30.00, U.S., check or money order only).

If calculating aren't your cup of tea, you can order primary arc directions calculations from most any astrological computing service. Make sure to specify the "True Solar Arc in Right Ascension" timing option. ☐

PREDICTION

Given a time of birth (here Sidereal Time = 22h 13m 40s), to direct a planet to a given angle, you will need to have a table of houses and an ephemeris for the birth year, and you must know the mechanics of erecting a horoscope. Example: Mars conjunct Descendant d.

1) From the table of houses, calculate the Sidereal Time (ST) when the directed planet is on the angle: Mars (18°04' Capricorn) is on the Descendant (at the birth place latitude of 40N45) at ST = 23h 55m 50s.

2) From this ST, subtract the ST of birth. This difference is termed the "Arc of Direction" (the space in time between the moment of birth and the moment when the planet crosses the angle): Arc = 23h 55m 50s - 22h 13m 40s = 1h 42m 10s.

3) From the table of houses, calculate the ST when the longitude of the natal Sun is on the MC (Midheaven): Sun (4°19' Scorpio) is on the MC at ST = 14h 08m 13s.

4) Add the Arc of Direction (Step 2) to the ST of the natal Sun (Step 3) to obtain the ST of the Progressed Sun: ST of P Sun = 1h 42m 10s + 14h 08m 13s = 15h 50m 23s.

5) From the table of houses, find the longitude on the MC at the ST of P Sun: at ST = 15h 50m 23s, the MC = 29°47' Scorpio.

6) In the ephemeris, count the number of days and fractions from the GMT of birth until the Sun reached the longitude obtained in Step 5: Sun reached 29°47' Scorpio on November 22, 1858 at 7:59 GMT, which is 25.302 days after birth (October 28, 1858 at 0:45 GMT).

7) Convert days into years to obtain time when direction will operate: Age 25.302 = February 15, 1884 (mother and wife died February 14th).

RECTIFICATION

Given the date of a life event (e.g., death of feather) and a primary direction (e.g., Saturn conjunct IC c) which we assume caused that event, to compute the rectified time of birth.

1) Calculate the native's age at the event: Theodore Roosevelt's father died on February 9, 1878 = 1878.1095. Age = 1878.1095 - 1858.8241 = 19.2854 years.

2) Calculate the progressed date of the event: 19.2854 days after the GMT of birth (October 28, 1858 at 0:45 GMT) = November 16, 1858 at 7:32 GMT. That is, a year equals a day.

3) From the ephemeris, calculate the Sun's longitude on the progressed date: On November 16, 1858 at 7:32 GMT the progressed Sun's longitude was 23°42' Scorpio.

4) From the table of houses, calculate the ST when the longitude of progressed Sun is on the MC: 23°42' Scorpio is on the MC at ST = 15h 25m 15s.

5) From the table of houses, calculate the ST when the longitude of the natal Sun is on the MC: Natal Sun = 4°19' Scorpio, which is on the MC at ST = 14h 08m 13s.

6) The difference between the ST of the progressed Sun and the ST of the natal Sun equals the Arc of Direction to the event: Arc = 15h 25m 15s - 14h 08m 13s = 1h 17m 02s.

7) From the table of houses, calculate the ST when the longitude of the directed planet is on the angle to which it's being directed: Saturn = 11°40' Leo is on the IC at ST = 20h 56m 31s.

8) If the direction is converse ("c," counterclockwise), then add the Arc of Direction (from Step 6) to the ST when the directed planet is on the angle (from Step 7). If the direction is direct ("d," clockwise), then subtract the Arc of Direction from the ST when the directed planet is on the angle: Saturn conjunct IC is a converse direction, so 1h 17m 02s + 20h 56m 31s = 22h 13m 33s = Rectified ST of birth. This leads to a rectified Local Mean Time birth time of 7:49-11" P.M.

TO COMPUTE HOUSE CUSPS:

Compute the MC with Appendix formula A3 (using RA = Sidereal Time * 15)
☐

☐
Compute the ASC with Appendix formula A8
☐

☐
Campanus, Regiomontanus, and Placidus cusps can be computed directly from the Part of Fortune formulas on pages 100 - 103, using Arc = 30 for 2nd cusp, Arc =60 for 3rd cusp, Arc =120 for 5th cusp, Arc=150 for 6th cusp, etc.
If you want 8 watches or 24 half-houses instead of 12 normal houses, use multiples of 45 for the watches or multiples of 15 for the half-houses instead of multiples of 30.

Topocentric cusps can be calculated as explained on page 82: you use the Ascendant formula A8 but you substitute the Topo poles for the birth latitude - Arctan (tan latitude / 3) for cusps 11 and 3; and Arctan (2*tan latitude / 3) for cusps 12 and 2. Also, instead of RAMC you substitute RAMC - 60 for the 11th cusp, RAMC - 30 for the 12th cusp, etc.

Koch cusps can be calculated as explained on page 69. First you have to calculate the declination of the MC from Appendix formula A4, and then the DSA of the MC from Formulas I-1 and I-2 on pages 16 - 17; then you calculate the "division points": RA 11th = RAMC + DSA MC / 3; RA 12th = RAMC + 2 * DSA MC / 3; RA 2nd = RAMC + 4 * DSA MC / 3; RA 3rd = RAMC + 5 * DSA MC / 3. Then with these RA's and the declination of the MC you go into Ascendant Formula A8.

It is recommended that the practitioner read the Addenda on the Koch House System and also Inexact Astrology before adopting the Topocentric, Koch, or Alcabitius methods. The mathematical formulations of these systems are severely flawed, and the (sometimes outlandish) claims made for the efficacy of these systems can be easily shown to be false.

TO DESIGN ASTROLOGICAL SOFTWARE:

Besides this book (for celestial sphere geometry and algorithms) astrological software designers need the book *Astronomical Algorithms* by Jean Meeus (for calendrical and planetary position calculations). This book, together with software in Turbo Pascal, Basic, or C (which you can integrate into your own applications) is available from Willmann-Bell, P.O. Box 35025, Richmond VA 23235 (www.willbell.com).

TO OBTAIN OFF-THE-SHELF PRIMARY DIRECTIONS SOFTWARE:

I recommend ***PLACIDUS*** by Dr. Rumen Kolev, available from him at: rumen_k_kolev@yahoo.com
This software features a 3-dimensional, rotating celestial sphere model which is indispensable for visualizing celestial sphere geometry.

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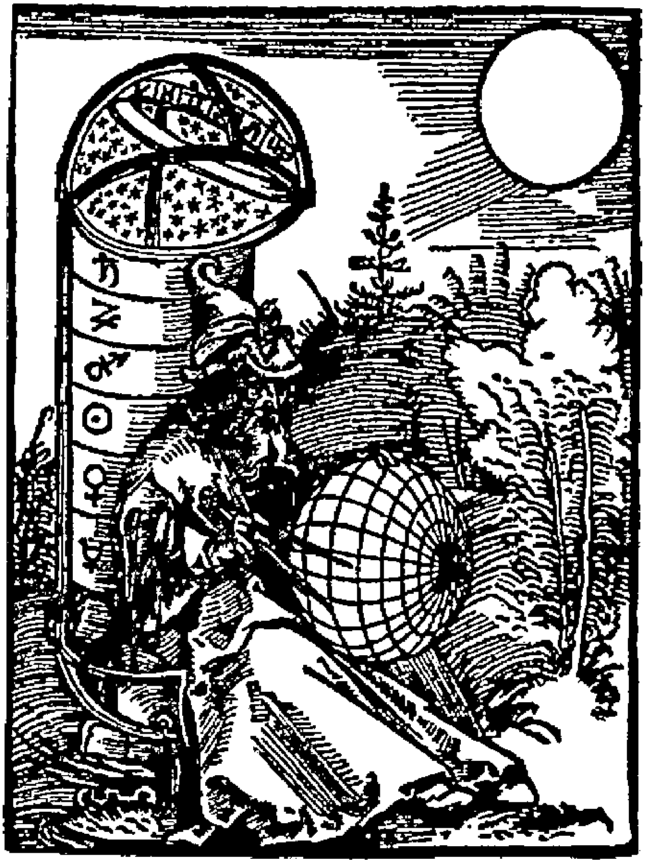

Thought Forms

by Bob Makransky

ISBN 0-9677315-3-4 Trade paperback, 264 pages – $19.95

Neither a dry, philosophical treatise, nor a book of do-goody inspiration, *Thought Forms* is a practical, no-holds-barred guide to the theory and practice of magic, for people who really want to turn their lives around. Starting out with a description of birth types based upon Mercury's position in its cycle around the sun, *Thought Forms* delineates a complete system of magical theory and training presented from the astrological point of view. Includes complete tables for 1900 – 2050 A.D. and instructions for using the Mercury cycle in secondary progressions and transits.

Review Excepts (for complete reviews click on the "Books" page of **www.dearbrutus.com**)

Diamond Fire – Joseph Polansky

Thought Forms is an interesting mixture. It starts off as a treatise on the planet Mercury and winds up taking us on an excursion through the psychic and mental worlds. The book should appeal to astrologers and non-astrologers alike. Steady *Diamond Fire* readers are well acquainted with the genius of Bob Makransky. ... At times he is iconoclastic, at other times infuriating – but always, invariably, illuminating. This is someone who does his homework and knows whereof he writes. ... Highly recommendable.

American Astrology – Kenneth Irving

Makransky's effort is quite a bit different than the usual Mercury book, as it is based on some rather deep philosophical considerations – which nevertheless Makransky gives a practical spin. ... The real subject of this book, at the astronomical level, is Mercury's synodic cycle. At an astrological level, it is the effect this cycle has at the interpretive level. At the philosophical level, however, the book is concerned less with giving the reader hints and tips on using Mercury in a practical everyday sense than it is about placing Mercury configurations in larger context. ...*Thought Forms* is both highly readable and highly informative, and is very definitely worth checking out.

Considerations – Ken Gillman

The author discusses the theory of thought forms from four very different perspectives: astrological, psychological, metaphysical and magical. He interprets the different phases of Mercury's synodic cycle in terms of the natal chart and its progressions and transits. ... Over the years *Considerations* has been pleased to publish several articles by Bob Makransky. Readers have become familiar with his fresh insights into different facets of astrology. In this book *Thought Forms* he is especially provocative and I strongly recommend its purchase and study.

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